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DEPARTMENT OF MECHANICAL ENGINEERING MONTHLY NEWS – FEBRUARY 2025

ABOUT DEPARTMENT OF MECHANICAL ENGINEERING

The department offers UG program in B.E Mechanical engineering from the year 2005. The department started a PG program M.E Industrial Safety Engineering from this academic year 2018- 2019. This course has wide range of job opportunity in the Industrial and Academic sector of India as well as abroad. The Department aims at providing the students with a perfect blend of intellectual and practical experiences with the support state-of-the-art laboratories and well-defined academic structure. The UG program is accredited by National Board of Accreditation (NBA). The special feature of the Department has established three applied laboratories, in addition to the regular labs to support students to master skills to make each one industry-ready, with a solid grounding in the principles and practice of Mechanical Engineering. We also have a strong academy for training students to appear for GATE exam.

VISION OF THE DEPARTMENT

To produce competent Mechanical Engineers of excellent technical and managerial skills with profound morality for global, national and confront societal development.

MISSION OF THE DEPARTMENT

1. To provide quality education in Mechanical Engineering with an interdisciplinary approach, encouraging innovation, research, and Entrepreneurship through world-class infrastructure and proficient teachers.
2. To make the department self-reliant through multiple programs with excellent curricula, best practices, and industry exposure.
3. To inculcate technical, professional, and leadership skills, moral ethics, and lifelong learning.

Programme Educational Outcomes

The Bachelor of Mechanical Engineering curriculum is designed to impart Knowledge, Skill, and Attitude to the graduates to

PEO 1: Have a successful professional career in Mechanical Engineering and allied industries, either by employment or through entrepreneurship.

PEO 2: Establish competency in Design, Thermal, Materials, and Manufacturing system with ethics and social responsibility.

PEO 3: Have a continual receptiveness for leadership and social challenges.

Message from the Head of the Department

**Dear Colleagues,
Greetings!**

I have great pleasure and pride in announcing that the Department of Mechanical Engineering is publishing the newsletter for the month of February 2025. We are steadfast in our progress as it involved various activities that enabled the hidden talents of the department students and faculty members to be brought to light, Our faculty members are continuously attending various training programs, publishing research papers, and book chapters, and are also working on getting patents.

This newsletter is the reflection of department activities that showcase all the events held in the department, the contributions of faculty members, and students, and the best practices adopted. I would like to congratulate all the members of the editorial board for their sincere effort to realize this venture.

Dr. R. Samuel Hansen, M.E., Ph.D.
Professor & Head
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Workshops/ Training Organized

UNMANNED AERIAL VEHICLES APPLIED LAB

Applied Lab Special Initiative Skill training has conducted for IInd Students in the topic of **“Drone Assembly & Calibration”** On **08.02.2025**. During Four days of training (04.02.2025 to 07.02.2025) the students were learned about design of unmanned areal vehicles like aircraft used on engineering drawings. By understanding the various commands used for drawing different structural models, Students were able to draw basic models. Then they practiced to draw different objects using solid works. Then students were trained to fabricate RC planes and aircraft models using vinyl sheets and fitting different instruments for flying. At the end of each day training students were assessed by assignments and on the final day student submitted individual test projects. CSBS students were learned about the Tinker CAD software for it applications in 3D design. A basic web-based 3D design tool is called Tinker CAD. With a few features, one may create new objects by using basic forms that are then combined, cut, rotate, move, and edit manually in addition to using accurate measurements. A basic web-based 3D design tool is called Tinker CAD. With a few features, one may create new objects by using basic forms that are then combined, cut, rotate, move, and edit manually in addition to using accurate measurements. Tinker CAD has a special module called Tinker CAD Classrooms for teachers and students. The training has conducted by Dr.K.Robinston Jeyasingh, AP/Mech & Unmanned Areal vehicles Applied Lab in-charge.



INNOVATION AND PRODUCT DEVELOPMENT APPLIED LAB

Topic: Modeling and fabricate

Second year mechanical engineering #06 batches of 21 students have involved to Modeling and fabricate the respective projects On **04.02.2025 to 07.02.2025**.

Day-01:

SSIG plan verification, Event registration & uploading of certificates in FIP.

SSIG-01	Urban terracotta cooling system
SSIG-02	Automatic water dispenser
SSIG-03	360' Selfie camera booth
SSIG-04	Solar dryer
SSIG-05	Ko-kart
SSIG-06	Vacuum dust Collector

Day-02:

By using Computer-Aided Design (CAD) software (e.g., SolidWorks, Autodesk Inventor), 3D modeling methods (e.g., wireframe, surface, solid modeling), Parametric modeling & Reverse engineering methods modeling has been done. Fabrication carried out by Machining (milling, turning) & by arc welding.

Day-03:

Project fabrications have been done.

Day-04:

Assessment on project fabrication and PPT Evaluation has been carried out.

1. Successful projects demonstrating modeling and fabrication techniques.
2. Industry-specific applications.
3. Emerging trends and technologies.
4. Students learned and received certificates from online courses.



To conclude the session, students to enhance their competency in the provided skills. The training session was handled by Dr.S.Sheik Sulaiman, AP/Mechanical. Innovation & Project Development Applied lab in charge.

Topic: Tinker CAD Software

First year mechanical engineering #06 batches of 22 students have involved to learn Tinker CAD Software On **17.02.2025 to 19.02.2025**.

Day-01:

Tinkercad which is web, based software used to create and share 3D model files. What makes Tinkercad so great is how easy it is to use. If you can click and drag, then you can use Tinkercad. We'll notice that Tinkercad automatically assigns any new project you create a name B usually something silly sounding. You can change you project name by clicking on the Tinkercad B assigned project name in the upper left corner of your screen.

Day-02:

Design: This is the default screen which shows the standard workplane for your 3D designs.

Blocks: Allows you to design and view your work in "Minecraft" style.

Bricks: Allows you to design and view your work in "Lego" style.

Shape generators: With this function, you can create your own shapes using Javascript and save them to be used later by you or the Tinkercad community.

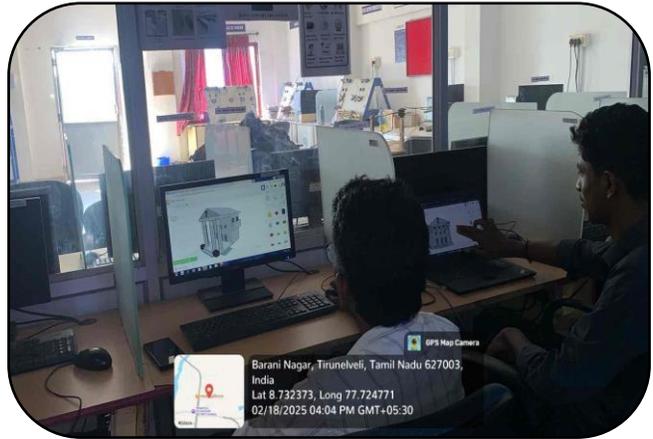
What's New: Check out descriptions and modeling of the newest features in Tinkercad.

Collaborate: Click this button to share your work with others.

Day-03:

Assessment on project modeling and PPT Evaluation has been carried out.

1. Successful projects demonstrating modeling techniques.
2. Industry-specific applications.
3. Emerging trends and technologies.
4. Students learned and received certificates from online courses.



To conclude the session, students to enhance their competency in the provided skills. The training session was handled by Dr.S.Sheik Sulaiman, AP/Mechanical. Innovation & Project Development Applied lab in charge.

Topic: design and fabricate

Third year mechanical engineering #06 batch of 23 students have involved to design and fabricate the respective projects On **08.02.2025 to 13.02.2025** .

Day-01:

SSIG plan verification, Event registration & uploading of certificates in FIP.

Day-02:

Concept Development

1. Idea Generation: Generate and evaluate initial product concepts.
2. Concept Screening: Screen concepts based on feasibility, cost, and market potential.
3. Concept Refinement: Refine the selected concept, including layout, materials, and mechanisms.

Design and Development

1. Detailed Design: Create detailed CAD models, drawings, and specifications.
2. Finite Element Analysis (FEA): Perform structural, thermal, and dynamic analysis.
3. Design for Manufacturability (DFM): Ensure design is suitable for production.
4. Design for Assembly (DFA): Optimize design for efficient assembly.

Day-03:

Project fabrications and web page creation work has been done.

Day-04:

Assessment on project fabrication and PPT Evaluation has been carried out.

And also students learned online certificate courses.



To conclude the session, students to enhance their competency in the provided skills. The students built and analyze to meet real world system and evaluate the performance. The training session was handled by Dr.S.Sheik Sulaiman, AP/Mechanical. Innovation & Project Development Applied lab in charge.

Student Achievements

Innovation and Product Development Applied Laboratory

Competition and Course Certificates : Feb -2025

S Sri Rama Subramanian of Mechanical Engineering Department has successfully completed a course about MECHANICAL AUTOCAD FOR BEGINNERS On 13-02-2025.



R.M Bala Krishnan of Mechanical Engineering Department has successfully completed a course about Upskilling program On 25-02-2025.



Innovation Conclave 1.0 conducted by StartupTN



Ramkishore K.T II Year MECH of unmanned aerial vehicle lab has participated in the Gyan mitra contest held at Mepco on 20.02.25



Faculty Orientation / Development

This is to certify that Dr, M. Kannan, Professor, Department of Mechanical Engineering, from Francis Xavier Engineering College, has successfully completed industrial training at KRAFT MEDI SYSTEMS, from 31.01.2025 to 04.02.2025.

During the training, he gained practical insights into business process development, including design modification for mass production using off-the-shelf components, ease of manufacturing, manufacturing process engineering, vendor development, product pricing, margin fixation, vendor capacity analysis, and drafting vendor agreements.

Dr. M. Kannan demonstrated keen interest, professionalism, and a disciplined approach throughout the training.



This is to certify that Mr. DAVID BLESSLEY S. Assistant Professor of Francis Xavier Engineering College has successfully participated and completed AICTE Training And Learning (ATAL) Academy Faculty Development Program on NAVIGATING THE GREEN REVOLUTION: INTEGRATING ELECTRIC VEHICLES AND HYDROGEN FUEL TECHNOLOGIES FOR SUSTAINABLE MOBILITY at KAMARAJ COLLEGE OF ENGINEERING & TECHNOLOGY from 03/02/2025 to 08/02/2025.



Entrepreneurship / EDI activities

On February 4, 2025, the Entrepreneurship Development Cell (EDC) and the Institution's Innovation Council (IIC) organized a session titled "Entrepreneurial Opportunities for Budding Mechanical Engineers" in collaboration with the Department of Mechanical Engineering. Held offline from 1:30 PM to 4:30 PM, the event saw 51 students in attendance.

Dr. K. Vinukumar, Assistant Professor of Mechanical Engineering at Francis Xavier Engineering College, Tirunelveli, led the session. He discussed various entrepreneurial opportunities for mechanical engineers, including engineering consulting, mechanical component manufacturing, smart home products, HVAC systems, maintenance services, educational content creation, drone design, CAD tools, vehicle tuning, hydraulics, pneumatics, and 3D printing services. Students found the session extremely valuable and encouraging, providing positive feedback on how it motivated them to pursue their goals with renewed enthusiasm. The session concluded with a Q&A segment, where clear and helpful answers were provided to address the participants' questions.

The event was conducted under the guidance of Dr. Lourdes Poobala Rayen, Director of the EDC. The session aimed to inspire students to explore entrepreneurial ventures within mechanical engineering, equipping them with valuable insights for future success.



conduct was commendable, and he actively engaged in learning and discussions.

“Entrepreneurship a Viable Career Choice in the Digital Era”

An “Entrepreneurship a Viable Career Choice in the Digital Era” program was organized by the Entrepreneurship Development Cell and the Institution’s Innovation Council in association with the Department of Mechanical Engineering on February 25, 2025, from 9:30 AM to 12:30 PM. The event was held in offline mode. Dr. K. Vinukumar, Assistant Professor (Mechanical Engineering), inaugurated the session with a welcome address. The session was conducted by Prof. Ravi Arumugam, Additional Director of Industrial Safety and Health (Retd), Govt of Tamil Nadu. A total of 51 students participated in the program, which was coordinated by Dr. K. Vinukumar. The event was conducted under the guidance of Dr. Lourdes Poobala Rayen, Director of the EDC.

The session was conducted by Prof. Ravi Arumugam, Additional Director of Industrial Safety and Health (Retd.), Govt of Tamil Nadu. He provided valuable insights into the evolving entrepreneurial ecosystem, highlighting how technology, digital platforms, and government initiatives have made entrepreneurship a viable career choice. He also discussed the essential skills required for aspiring entrepreneurs, including problem-solving, risk management, and financial planning. He also highlighted safety-related equipment, business opportunities, and various schemes. Mechanical engineering students can leverage their technical expertise, digital tools, and emerging technologies to build successful businesses. With the right mindset and a focus on innovation, entrepreneurship presents a promising and rewarding career path in today's evolving world.

The program successfully highlighted the viability of entrepreneurship as a career choice in the digital era. The interactive session provided students with motivation, knowledge, and practical guidance to explore entrepreneurial opportunities. The event concluded with a vote of thanks, expressing gratitude to the resource person, organizers, and participants.



Projects/Products Developed

Drone Delivery system



The primary objective of this project is to reduce delivery times, minimize human labor, and enhance accessibility to remote or difficult-to-reach areas. The system is particularly valuable for urgent deliveries, such as medical supplies, or in regions where traditional delivery methods are impractical or inefficient.

Agricultural Drone



This project involves the design and development of a **Smart Agricultural Drone** to enhance modern farming practices through automation and data-driven decision-making. The drone is equipped with advanced sensors and imaging technologies to monitor optimize irrigation, apply fertilizers and pesticides.

Water Rescue Drone



The Water Rescue Drone Project aims to develop an innovative, unmanned aerial and/or surface vehicle capable of performing swift, remote water rescue operations in hazardous environments. Designed to aid lifeguards, emergency responders, and disaster relief teams, the drone system enhances safety, reduces response times, and mitigates risks to human rescuers.

Club Activities

PROPER USE OF EQUIPMENT & PPE

Personal Protective Equipment (PPE) is a cornerstone of workplace safety across numerous industries, particularly in environments where employees are exposed to hazardous conditions. From construction sites to healthcare settings, wearing the appropriate PPE is essential to protect workers from potential injuries, illnesses, and other health hazards. "PROPER USE OF EQUIPMENT & PPE" Safety Club report explores the fundamental PPE items that safeguard employees, examining their purpose, use, and importance in maintaining a safe work environment.

Head Protection:

The first line of defense begins with head protection, typically in the form of helmets or hard hats. Head injuries are common in industries like construction, manufacturing, and mining, where falling objects, low ceilings, or collision risks are prevalent. A hard hat is designed to absorb impact energy and protect against falling debris, electrical hazards, and sharp objects.

- **Hard Hats:** Often made of high-density polyethylene (HDPE) or fiberglass, hard hats are available with a variety of suspension systems that help absorb shock and provide a comfortable fit.
- **Safety Helmets:** In some high-risk environments, workers may also use specialized helmets, such as those used in electrical work, which feature additional protection from electrical hazards.

Head protection must be inspected regularly for damage such as cracks or dents, and workers should ensure proper fit to maximize effectiveness.

Eye and Face Protection:

Eye and face protection are crucial in workplaces where workers are at risk of flying particles, chemical splashes, radiation, or intense light. Common items in this category include safety glasses, goggles, face shields, and welding helmets.

- **Safety Glasses:** These provide basic protection against dust, debris, and minor impacts. They are commonly used in laboratories, workshops, and assembly lines.

- Goggles: Offering a more secure fit, goggles protect workers from hazardous chemicals, flying particles, and intense light. They are a necessity in chemical labs, construction sites, and environments where airborne particulates are common.
- Face Shields: Used in conjunction with safety glasses or goggles, face shields offer additional protection against chemical splashes or heat. These are often used in medical environments, during welding, or when handling toxic substances.
- Employers should ensure that protective eyewear is free from scratches or other imperfections that could compromise its effectiveness.
- Hearing Protection:
 - Loud noise is a frequent hazard in many industries, including manufacturing, construction, and entertainment. Prolonged exposure to high noise levels can lead to permanent hearing damage or loss. Therefore, hearing protection is essential in environments where noise exceeds safe levels.
 - Earplugs: These are inserted into the ear canal and are effective in environments with moderate noise levels. They are often used in construction, factory settings, or during aviation operations.
 - Earmuffs: Offering a higher level of protection, earmuffs cover the outer ear and are designed to block out loud, persistent noise. These are commonly worn in high-noise environments such as factories, construction zones, or on aircraft.
 - Regular maintenance of hearing protection devices is essential to ensure they are functioning properly and providing adequate sound insulation.
- Foot Protection:
 - Foot protection is essential to prevent injuries caused by heavy objects, sharp materials, chemicals, or electrical hazards.
 - Safety Boots: Steel-toe boots are a staple in many industries where workers are exposed to falling objects, sharp debris, or heavy machinery. These boots provide extra protection around the feet and ankles.
 - Non-slip Shoes: In food service, healthcare, and certain manufacturing environments, non-slip footwear prevents slipping on wet or oily surfaces, reducing the risk of falls.

- Rubber Boots: For work in wet or hazardous environments, rubber boots provide protection from water, chemicals, or electrical hazards.
- Conclusion:
- The proper use of Equipment & PPE is critical to preventing injuries and illnesses in the workplace. By providing employees with the appropriate protective equipment—from head to toe—employers can ensure a safer, healthier work environment. However, PPE alone is not enough; training, regular maintenance, and hazard assessments must also be a part of a comprehensive safety program. The combination of well-designed protective gear and diligent safety practices is the key to fostering a culture of safety at work.



Alumni Interaction

FX Alumni Association organized a guest lecture in association with department of Mechanical Engineering for the Second year Mechanical students On **06-02-2025**. **Er.K.K.Syed Sulthan., HVAC Maintenance Engineer., Integra Projects and Facility Management W.L.L | BMS Company, Qatar** delivered the guest lecture on **“Smart HVAC Technologies: Revolutionizing Comfort and Energy Management”**. A heartfelt greeting to the resource person is extended by Dr. R. Samuel Hansen, HOD-MECH. The expert resource thanked the management for offering him this opportunity.

A guest lecture on "Smart HVAC Technologies: Revolutionizing Comfort and Energy Management" was conducted to provide insights into the latest advancements in heating, ventilation, and air conditioning (HVAC) systems. The session began with an overview of traditional HVAC systems and their limitations in energy efficiency and environmental impact. The speaker emphasized the growing need for smart HVAC solutions that incorporate IoT, AI, and automation to optimize performance, reduce energy consumption, and improve indoor air quality.

The speaker elaborated on the integration of smart thermostats, cloud-based controls, and AI-driven analytics that enable automated temperature regulation and energy conservation. Case studies of modern buildings and industries implementing smart HVAC technologies were presented, showcasing significant energy savings and operational benefits. The role of renewable energy sources, such as solar-powered HVAC systems, was also highlighted as a crucial step toward sustainable building management. Additionally, advancements in demand-based ventilation and thermal comfort optimization were discussed as key components in improving occupant experience.



The lecture concluded with an interactive Q&A session, where students and faculty explored challenges in adopting smart HVAC technologies, including initial costs, cybersecurity concerns, and system interoperability. The session provided valuable knowledge on how mechanical engineers can contribute to the future of HVAC systems by incorporating intelligent automation and sustainable solutions. Overall, the lecture was highly informative and shed light on the technological transformations shaping the HVAC industry today

FX Alumni Association organized a guest lecture in association with department of Mechanical Engineering for the Second year Mechanical students On **27-02-2025**. **Er.A.Mohamed Rabeeq., Senior Client Partner., Access Health Care., Chennai** delivered the guest lecture on **“Biomechanics of the Musculoskeletal System: Insights for Prosthetics Design”**. A heartfelt greeting to the resource person is extended by Dr. R. Samuel Hansen, HOD-MECH. The expert resource thanked the management for offering him this opportunity.

A guest lecture on "Biomechanics of the Musculoskeletal System: Insights for Prosthetics Design" was conducted to provide a deeper understanding of how biomechanics plays a crucial role in developing advanced prosthetic devices.

The session began with an introduction to the structure and function of the musculoskeletal system, highlighting the importance of joint mechanics, muscle forces, and movement analysis in designing prosthetic limbs. The speaker explained the challenges in replicating natural limb function, emphasizing the need for precise biomechanical modeling and real-world gait analysis to create prosthetic devices that improve mobility and comfort for users.

The lecture covered the latest innovations in prosthetic design, including bionic limbs, neural-controlled prostheses, and energy-storing materials. The speaker demonstrated how cutting-edge technologies like 3D printing, artificial intelligence, and pressure-sensing actuators are transforming the field, enabling more personalized and adaptive prosthetic solutions. Case studies were presented, showing successful applications of biomechanical principles in designing prosthetics for amputees and individuals with mobility impairments. The importance of integrating biomechanics with robotics and sensor technology was also highlighted to enhance the responsiveness and natural movement of prosthetic limbs.

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51-100 BAND

Alumni Event

27th FEB 2025
11:00 AM to 12:00 PM

Topic
Biomechanics of the Musculoskeletal System: Insights for Prosthetics Design

Organised by **FX Alumni Association**
in Association with **Department of Mechanical Engineering**

A.MOHAMED RABEEQ
Senior Client Partner,
Access Health Care.,Chennai

Co-ordinator
Mr. S.M. Sunder Rajan
Assistant Professor
Dept. of Mechanical Engineering

Convener
Dr. R. Samuel Hansen
HOD
Dept. of Mechanical Engineering

Mr. S. Krishnakumar
Director, FXAA

Dr. V. Velmurugan
Principal, FXEC

PLATINUM RATING

Washington Accord
INTERNATIONAL ENGINEERING ALLIANCE

NBA
NATIONAL BOARD OF ACCREDITATION

THE HIGHEST STAR STATUS
The Highest Star Status by the MOE, Govt. of India for Innovation and Entrepreneurship Activities



The session concluded with an engaging discussion on the future of prosthetic development and the role of mechanical engineers in this evolving field. Key challenges such as affordability, durability, and the need for continuous advancements in material science were addressed. The lecture provided valuable insights into how biomechanics serves as the foundation for prosthetic innovation, inspiring students to explore research and career opportunities in biomedical engineering. Overall, the session was highly informative, offering a comprehensive view of how technology and biomechanics are shaping the future of prosthetic design.

Field/Village Visit

The village outreach program was organized On 21.02.2025 at NANJANKULAM with the primary objective of strengthening the bond between technical institutions and rural communities for 50 - II YEAR Mechanical Engineering Students . It aimed to foster community engagement, improve awareness among villagers about government schemes, and support them in accessing various public welfare services .

Activities Conducted

- **Interaction with Villagers:** Students engaged with local residents to understand their daily challenges and socio-economic conditions.
- **Awareness Sessions:** Informative talks were conducted on central and state government schemes related to healthcare, education, agriculture, and digital services.
- **Assistance in Documentation:** Students guided villagers in understanding and preparing the required documents for availing of schemes like PM-KISAN, Ayushman Bharat, and Digital India services.
- **Feedback Collection:** A survey was conducted to gather inputs from the villagers on their awareness levels and access to government support.

Outcomes

- Improved awareness among villagers about at least 8 major government schemes.
- Several villagers were identified who required help in documentation, and follow-up assistance has been planned.
- Students gained firsthand experience in community engagement and social responsibility.

Conclusion

The outreach visit proved to be a mutually enriching experience. It not only enhanced the students' understanding of rural realities but also empowered villagers by connecting them to vital government resources. The department plans to conduct follow-up visits to ensure sustained support.



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