FRANCIS XAVIER®
ENGINEERING COLLEGE
AN AUTONOMOUS INSTITUTION
Accredited BY NBA | AICTE Sponsored Margdarshan Mentor Institution
DST-FIST Supported Institution | ISO 9001:2015 Certified
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DEPARTMENT OF MECHANICAL ENGINEERING MONTHLY NEWS – APRIL 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 April 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.

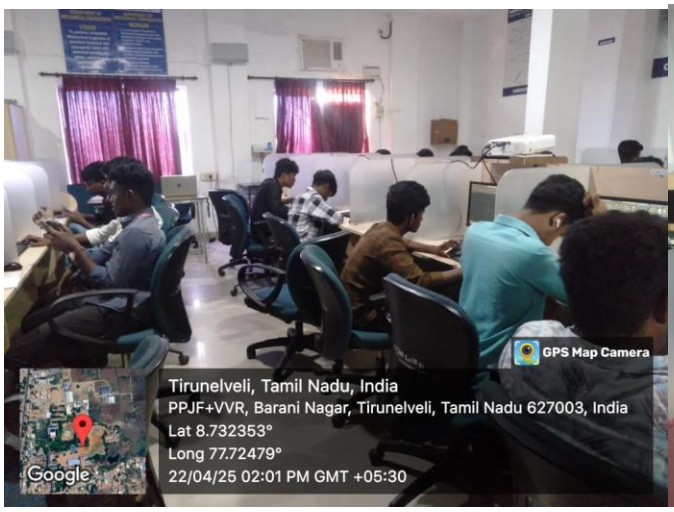
Dr. R. Samuel Hansen, M.E., Ph.D.
Professor & Head
samuelhansen@francisxavier.ac.in

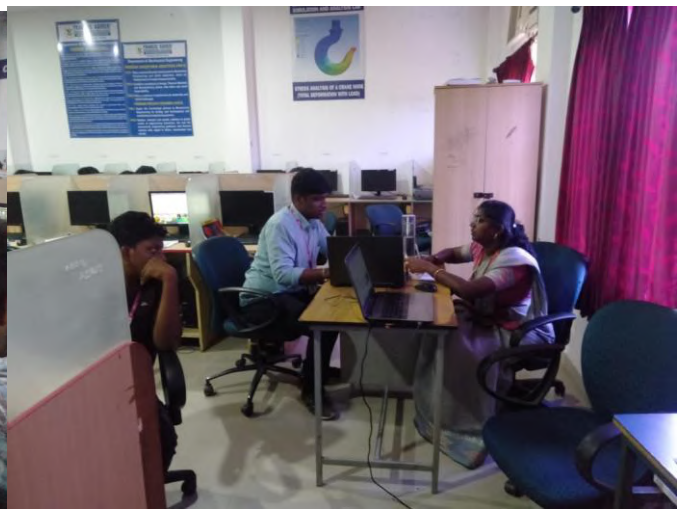
Value Added Course

Design of Simple Machine Components

A Skill Based Value Added Course (SVAC) on “Design of Simple Machine Components” was successfully organized for First Year B.Tech students during the Even Semester of the academic year 2024–2025, from 15th April to 25th April 2025. This course was coordinated by Dr. K. Ariyanayagam, ASP/MECH, and Dr. S. M. Rajkumar, ASP/MECH, with the objective of introducing students to the fundamentals of mechanical component design. The sessions covered both theoretical concepts and hands-on practice, focusing on the design of basic machine elements like shafts, keys, couplings, and fasteners.

Students actively engaged in practical sessions, assignments, and assessments, which were conducted in a structured manner including attendance, task-based evaluation, hands-on performance, and a final viva. The course provided an excellent platform for students to gain foundational skills in machine design, fostering their interest and competence in core mechanical engineering subjects. The positive feedback from participants reflected the effectiveness of the course in achieving its skill development goals.





Alumini Interaction

Modern Manufacturing Techniques: Bridging the Gap Between Lab and Shop Floor

FX Alumni Association organized a guest lecture in association with department of Mechanical Engineering for the Second year Mechanical students. **Er.A.Mohamed Ibrahim., Supervisor , Steel Strips Wheels Limited., Chennai** delivered the guest lecture on **"Modern Manufacturing Techniques: Bridging the Gap Between Lab and Shop Floor**" on 09-04-2025. 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.

The guest lecture on "Modern Manufacturing Techniques: Bridging the Gap Between Lab and Shop Floor" provided valuable insights into the evolving landscape of industrial manufacturing. The speaker, an expert from the field, began by emphasizing the increasing adoption of Industry 4.0 principles, he highlighted the role of smart manufacturing, automation, and digital twins in reducing production errors and enhancing efficiency.

The session explored several cutting-edge techniques, including additive manufacturing (3D printing), CNC machining, and advanced material processing methods. Real-world case studies were shared to demonstrate how these technologies are reshaping industries by reducing lead times and enabling mass customization. The speaker also stressed the importance of upskilling the workforce to adapt to the rapidly changing technological environment and hands-on industry exposure.

The lecture concluded with an interactive Q&A session where students engaged actively, seeking guidance on research and career opportunities in modern manufacturing. The speaker's practical examples and emphasis on innovation and collaboration offered a new perspective on bridging the lab-shop floor gap. Overall, the session was highly informative and inspired students to think critically about the future of manufacturing and their role in it.

Mechanical Meets Digital: Careers at the Crossroads of Software and Hardware

FX Alumni Association organized a guest lecture in association with department of Mechanical Engineering for the Second year Mechanical students. **Er.G.Frankly Krithic Roshan., Assistant System Engineer., TCS., Chennai** delivered the guest lecture on **"Mechanical Meets Digital: Careers at the Crossroads of Software and Hardware**" on 30-04-2025.

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.

The speaker emphasized that today's industries increasingly demand engineers who understand not just mechanical components but also digital tools and automation. Key topics covered included smart product development, IoT in mechanical systems, robotics, digital twin technology, and industrial automation. He also discussed tools and languages such as Python, MATLAB, LabVIEW, and Arduino, which have become essential for engineers working on intelligent systems.

The speaker supported his points with real-world case studies from his projects, such as the development of a smart HVAC system and the automation of an industrial assembly line. He also provided career guidance by listing roles available for mechanical engineers in companies like Bosch, Siemens, Tata Elxsi, and L&T Technology Services. Students were encouraged to pursue interdisciplinary certifications and work on projects involving sensors and simulation software

The session ended with an engaging Q&A where students asked about transitioning into hybrid roles, choosing the right upskilling platforms, and preparing for placements in tech-driven mechanical sectors. The lecture was highly informative and inspired students to rethink their career paths by integrating digital skills with core mechanical knowledge. The department thanked the speaker for sharing valuable insights and motivating students to explore emerging opportunities in this field.

GUEST LECTURE

Special Lecture on AI in Metrology & Measurement

The Department of Mechanical Engineering organized a guest lecture on Forming of metals for II year Mechanical Engineering Students on 3rd April 2025. A total of 50 students have attended the program. Er. S. Ranjith Xavier Raj, B.E. Chief Manager (Technology - Mechanical), The National Small Industries Corporation Ltd, SIDCO Industrial Estate, Dindigul presided the program as chief guest. The program began with welcome address and followed by chief guest introduction by Dr. S. M. Raj Kumar, ASP/FXEC.

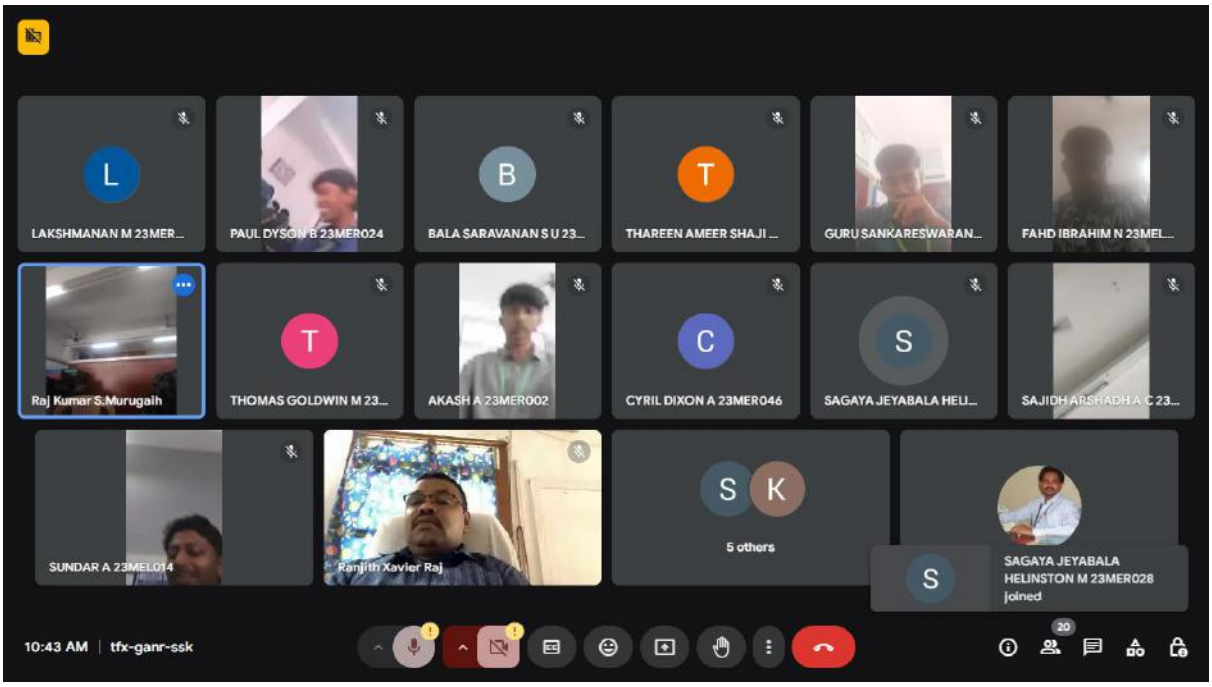
The resource person delivered an insightful and engaging lecture on the role of Artificial Intelligence in enhancing the accuracy, speed, and automation of measurement processes in engineering. Key points discussed included:

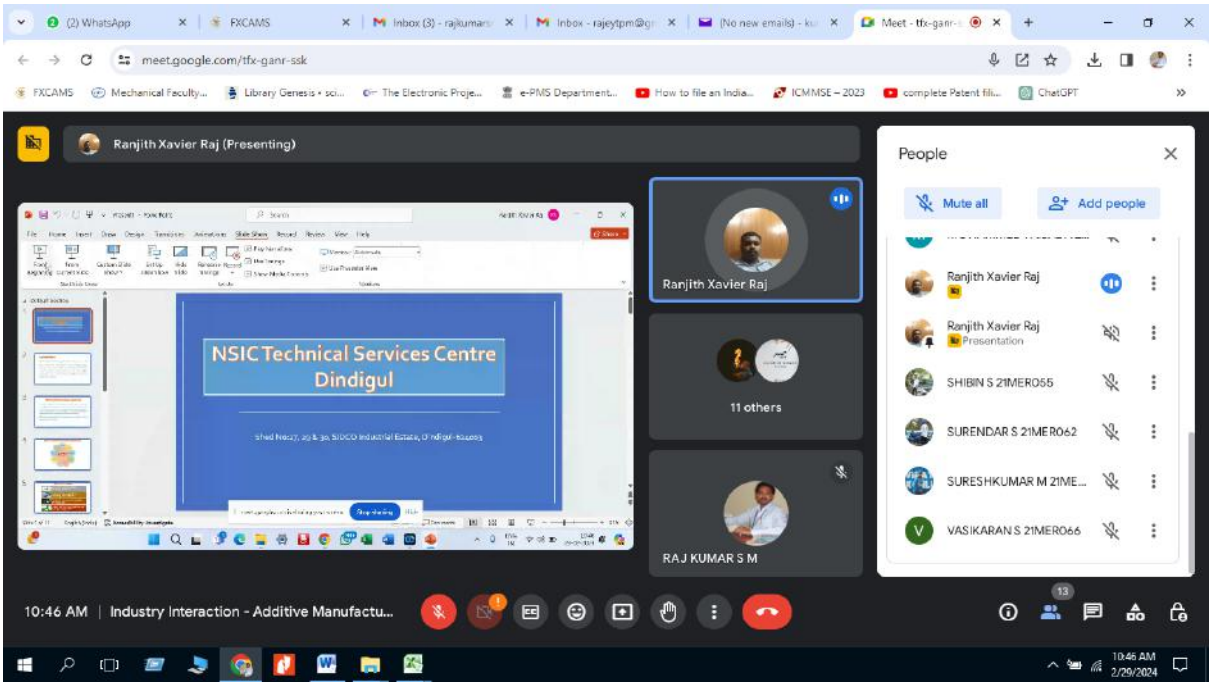
- The basics of Metrology and Measurement
- Introduction to AI and Machine Learning techniques
- Application of AI in predictive measurement, defect detection, and quality control
- Real-time case studies from smart manufacturing industries

The session was highly interactive, with students actively participating and raising thought-provoking questions. The resource person addressed each query with clarity and real-world examples, enriching the learning experience.

The event concluded with a **vote of thanks** by Dr. K. Vinukumar, AP/FXEC expressing gratitude to the resource person, management, faculty members, and students for making the lecture a successful and memorable one.

Overall, the lecture provided the students with a broader perspective on the advancements in measurement technologies and the growing impact of AI in the manufacturing sector.





Edited & Designed by Dr. K. Vinukumar, AP/Mech, FXEC SOCIAL MEDIA /FXEC Mechanical

Ignite Innovation, Empower Entrepreneurs

To celebrate and promote creative thinking and innovative problem-solving by showcasing how entrepreneurs can harness technology—like drone delivery—to transform industries and improve lives.

On 21.04.2025 a session was organized on the title **"Ignite Innovation, Empower Entrepreneurs"** by the EDII TN in association with Entrepreneurship Development Cell and Mechanical Engineering department. The session was handled by **Dr. K. Robinston Jeyasingh Swikker, Assistant professor, Francis Xavier Engineering College. 44 Second year Mechanical Engineering students and 2 faculties** participated in the program. This event was coordinated by Dr.K.Vinukumar, Assistant Professor, Department of Mechanical Engineering, Francis Xavier Engineering College.

- **Creative Thinking in Action:** Exploring how bold ideas lead to breakthrough solutions.
- **He Delivers by Drone:** A case study of an entrepreneur using drone technology to revolutionize last-mile delivery.
- **From Problem to Prototype:** Turning everyday challenges into business opportunities.
- **Impact Innovation:** How creative startups can address global issues such as accessibility, sustainability, and efficiency.
- **Empowering Through Innovation:** Interactive sessions and collaborations encouraging participants to pitch their own tech-driven ideas.
- **Future of Delivery:** Insights into how drones, automation, and AI are shaping the logistics of tomorrow.

On World Creativity and Innovation Day, we're reminded that innovation starts with imagination. From delivering packages by drone to solving critical social challenges, empowered entrepreneurs are shaping the future. Let today be a spark—because the world needs your next big idea.

FRANCIS XAVIER® ENGINEERING COLLEGE
AN AUTONOMOUS INSTITUTION
Vannarpettai, Tirunelveli

INSTITUTION'S INNOVATION COUNCIL
FXEC
IIC ID: IC20181472
TIRUNELVELI

CERTIFICATE OF PARTICIPATION

This is to certify that **AKAASH ABISHEK R S** of I year **Mechanical Engineering** has actively participated in the Discussion on **"Ignite Innovation, Empower Entrepreneurs"** presented by Dr. K. Robinston Jeyasingh Swikker, AP/Mech. The Session was Organized by EDC cell of Mechanical Engineering Department in association with Institution's Innovation Council of **Francis Xavier Engineering College**, Tirunelveli, Tamilnadu on 21.04.2025.

Coordinators

Dr.K.Vinukumar
Asst. Professor/ Mech

Dr.R.Samuel Hansen
HOD / Mech

Dr. Lourdes Poobala Rayen
Director, EDC
President, IIC

Dr. V. Velmurugan
Principal

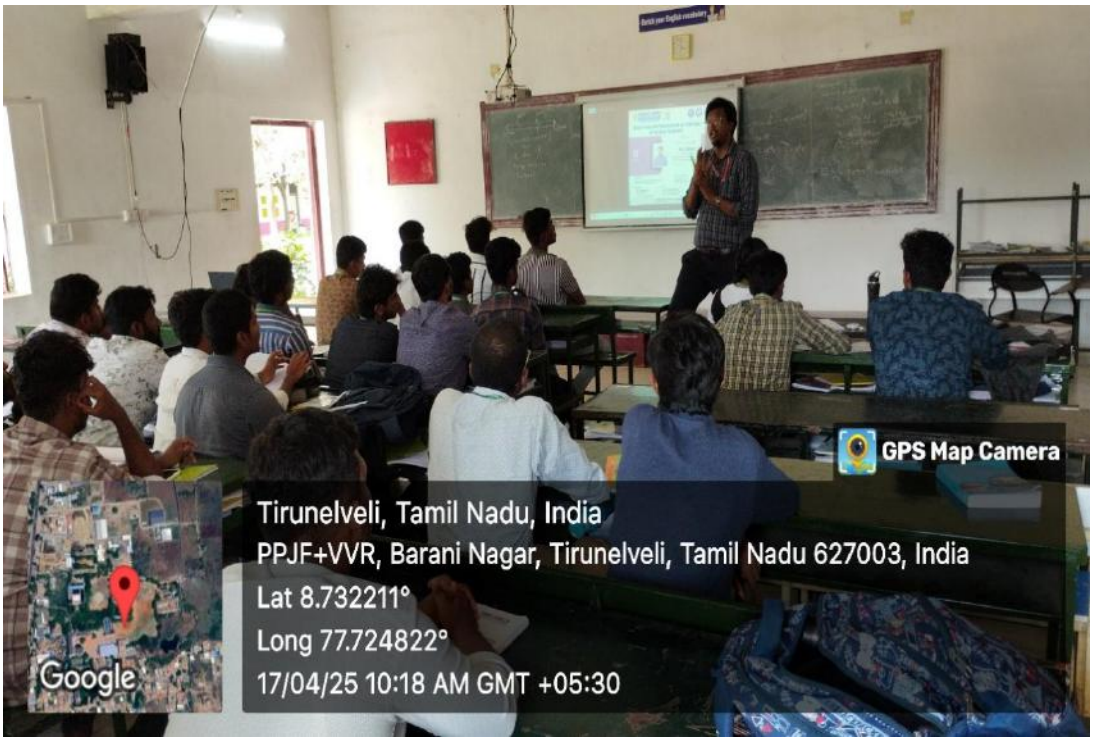
Edited & Designed by Dr. K. Vinukumar, AP/Mech, FXEC SOCIAL MEDIA /FXEC Mechanical

Smart Financial Management for Startups: A Practical Approach

To equip startup founders and early-stage entrepreneurs with the essential financial knowledge and tools needed to manage their finances effectively, make informed decisions, and ensure sustainable growth. On 17.04.2025 a session was organized on the title “Smart Financial Management for Startups: A Practical Approach” by the EDII TN in association with Entrepreneurship Development Cell and Mechanical Engineering department. The session was handled by Mr.S.Rakesh, Assistant professor, Francis Xavier Engineering College. 36 Second year and 5 third year Mechanical Engineering students and 2 faculties participated in the program. This event was coordinated by Dr.K.Vinukumar, Assistant Professor, Department of Mechanical Engineering, Francis Xavier Engineering College.

- Startup Financial Foundations: Understanding income statements, balance sheets, and cash flow statements.
- Cash Flow is King: How to monitor and manage cash flow effectively.
- Burn Rate & Runway: Calculating and managing how long your startup can operate before needing more funds.
- Budgeting Techniques: Lean budgeting strategies for resource-constrained startups.
- Key Metrics: CAC, LTV, Gross Margin, MRR/ARR, and how they impact decisions.
- Funding Strategy: Bootstrapping vs. external funding, and preparing for investor conversations.
- Financial Tools & Tech: Overview of essential tools like QuickBooks, Xero, and budgeting templates.
- Common Mistakes to Avoid: Financial pitfalls that can sink a startup early on.

Effective financial management involves being proactive, strategic, and disciplined with your startup's resources rather than becoming an accountant. Entrepreneurs may increase their runway, draw in the proper investors, and lay the groundwork for long-term success by learning the fundamentals and monitoring important indicators. Better decisions are fueled by financial clarity, and successful startups are the result of better decisions.


GPS Map Camera
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Lat 8.732211°
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Finite Element Analysis

The Department of Mechanical Engineering at Francis Xavier Engineering College organized a highly informative guest lecture on the subject of "Finite Element Analysis." The event took place on 29.04.2025 and was attended by 60 number of students and faculty members from the department.

We were honored to have Mr. M. Naganandhan, a talented designer from Credo System, Chennai, as the esteemed resource person for the session. Mr. Naganandhan brought a wealth of industry experience, sharing his knowledge on modern FEA trends, the significance of aesthetics in the automotive industry, and how vehicle aerodynamic styling impacts brand identity and user experience. He also highlighted the technological tools and software commonly used in design processes, providing the attendees with practical insights into the evolving world of vehicle styling.

The lecture was highly interactive, with students actively participating in the Q&A session, where they inquired about the challenges and opportunities in vehicle design. Mr. Naganandhan encouraged students to pursue their passion for design and provided useful tips on how to stay updated with the latest trends in the field.....

The event was a resounding success, offering valuable knowledge and inspiration to the attendees, helping them to broaden their understanding of the vital role of styling and design in the automotive industry.

Guest Lecture Report on Industry 4.0

The Department of Mechanical Engineering has conducted an Guest Lecture Program on Industry 4.0 for third-year Mechanical Engineering students on 28.04.2025, from 11:00 AM to 22:30 PM. The session was delivered by Dr. H. Kanagasabapathy, Professor, Department of Mechanical Engineering, CAPE Institute of Technology, Anjukramam, KK Dist. He was formerly professor in National Engineering college, Kovilpatti.

The lecture focused on the following key areas:

1. Definition and Evolution of Industry 4.02. Historical overview: From Industry 1.0 to Industry 4.0 3.

Key technologies: loT, Al, machine learning, cloud computing, big data, and cyber-physical systems. Smart Manufacturing and Automation. Use of sensors, robotics, and autonomous systems. Real-time data monitoring and predictive maintenance. 4. Impact on Workforce and Employment: Emerging skill requirements. Role of human workers in smart factories. 5. Case Studies and Applications: Examples from leading companies like Siemens, Bosch, and GE. 6. Use of digital twins and smart logistics: Challenges and Opportunities:Cybersecurity concerns. Cost of Implementation and scalability for SMEs

Outcomes of the Lecture:

Students gained foundational and practical insights into emerging Industry 4.0 technologies. Emphasis on the importance of interdisciplinary skills-especially in IT, data analytics, and automation.Sparked Interest among participants to pursue certifications and projects related to smart manufacturing. The guest lecture on Industry 4.0 was a resounding success. It bridged the gap between academic knowledge and industry expectations, encouraging students to explore new-age technologies shaping the future of work.

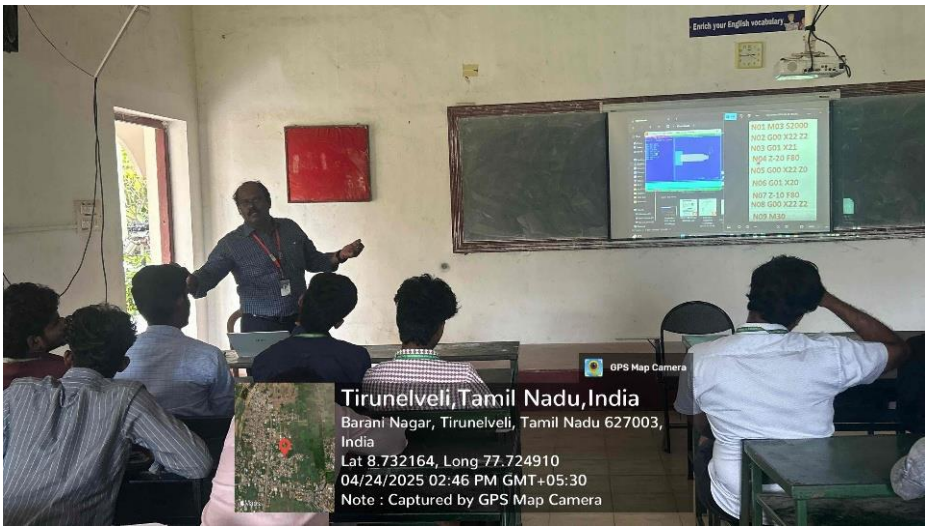
PATENT FILING

A patent has been successfully filed for the Rocker-Bogie Mechanism based fire rescue system developed in this project. The filing of this patent not only secures the intellectual property rights of the design but also establishes its novelty, technical significance, and industrial relevance. By integrating a stable mobility platform with advanced fire suppression and remote operation features, the system demonstrates a unique solution for addressing the hazardous conditions in cracker industries. The patent ensures legal protection, encourages further innovation, and validates the contribution of this work towards enhancing safety and automation in high-risk industrial environments.

Work Shop

CNC Programming

The Department of Mechanical Engineering organized a workshop on “CNC Programing” for II year Mechanical Engineering Students on 24th April 2025. A total of 15 students have attended the program. Mr.S.David Blessley, Assistant Professor, Department of Mechanical Engineering presided the program as Resource Person. The CNC Programming Workshop provided participants with a comprehensive understanding of Computer Numerical Control (CNC) programming, its applications, and hands-on experience with CNC programming using CNC Simulator. The event provided insights on both CNC Lathe and CNC Milling. The students were provided hands on experience on Datum setting, programming and simulating the output for validating the program generated. Participants gained foundational and practical knowledge of CNC programming, enhancing their skills in machining and automation. The workshop encouraged interaction, problem-solving, and collaboration among attendees, preparing them for industry applications.



INDUSTRIAL VISIT

The Department of Mechanical Engineering – II Year, consisting of 50 students, visited Naga Flour Mills, Dindigul, Tamil Nadu, as part of their curriculum-based industrial exposure. The objective of the visit was to enhance students' practical understanding of food manufacturing systems, mechanical handling of bulk materials, and automated production lines.

This visit was organized to give students real-time exposure to the machinery involved in flour milling, such as roller mills, sifters, conveyors, and pneumatic systems. It also provided valuable insights into equipment maintenance, safety protocols, industrial hygiene, and process optimization. Students explored various aspects of industrial automation, material flow, and the role of mechanical components in a large-scale manufacturing unit.

Naga Flour Mills, a unit of Naga Limited, is one of South India's largest flour processing industries. Established with state-of-the-art infrastructure, the company specializes in producing Maida, Rava, Atta, and Bran using advanced Bühler machinery. With strict adherence to ISO and HACCP quality standards, the industry showcases a perfect blend of mechanical engineering and food technology applications.

This visit was specifically arranged under the CNC Machines and Automation subject for the fourth-semester mechanical engineering curriculum. The event was coordinated and organized by Dr. J. Sangilimuthukumar, AP/Mechanical Engineering, and Mr. R. Rahesh, AP/Mechanical Engineering Department, who accompanied the students during the visit and ensured meaningful engagement throughout the session.

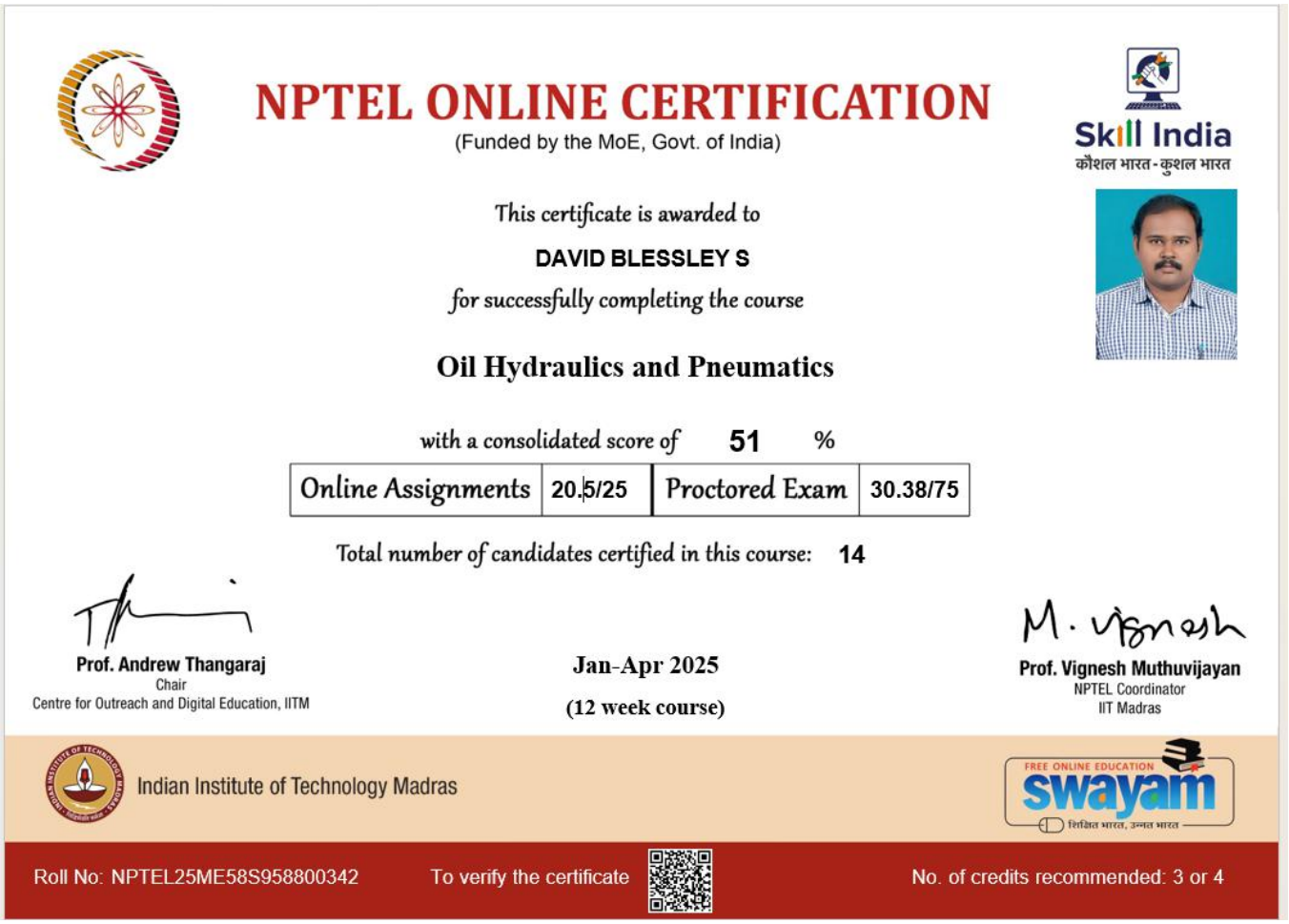
STAFF JOURNAL PUBLICATION

We are proud to share that our Mechanical Engineering faculty have published their research paper titled “Experimental Characteristics of 3D Printed Carbon Fiber Reinforced PLA Composites” in the International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET), Volume 8, Issue 4, April 2025. This achievement reflects their dedication to innovation and research excellence.

Edited & Designed by Dr. K. Vinukumar, AP/Mech, FXEC SOCIAL MEDIA /FXEC Mechanical

NPTEL CERTIFICATION

"Our Mechanical Department staff member has successfully completed the NPTEL Online Certification course on Oil Hydraulics and Pneumatics, conducted by IIT Madras during Jan–Apr 2025."



NPTEL ONLINE CERTIFICATION

(Funded by the MoE, Govt. of India)

Skill India
कौशल भारत-कुशल भारत

This certificate is awarded to

DAVID BLESSLEY S

for successfully completing the course

Oil Hydraulics and Pneumatics

with a consolidated score of 51 %

Online Assignments	20.5/25	Proctored Exam	30.38/75

Total number of candidates certified in this course: 14

Prof. Andrew Thangaraj
Chair
Centre for Outreach and Digital Education, IITM

Jan-Apr 2025
(12 week course)

Prof. Vignesh Muthuvijayan
NPTEL Coordinator
IIT Madras

Indian Institute of Technology Madras

FREE ONLINE EDUCATION swayam

Roll No: NPTEL25ME58S958800342 To verify the certificate No. of credits recommended: 3 or 4

CERTIFICATION

Competitions: Johann Devaprasanna J First Year of ECE (UAV Lab) has won second prize in 'Project Expo' event which was held by Rohini College of Engineering on 08.04.2025.


ROHINI
COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

THE FIRST YEAR ASSOCIATION
Organizes
SAHAR 25
TECH FEST FOR FIRST-YEAR ENGINEERS

CERTIFICATE FOR APPRECIATION

This is certify that Mr / Ms JOHANN DEVAPRASANNA J [ECE], of Francis Xavier Engineering College, Tirunelveli won First / Second prize in the event "Project Expo" of the National Technical Events "SAHAR'25" held on 4th April 2025.

Convenor

Principal