Volume No. 09
Issue No. 07

MARCH 2026

MExpress

Mechanical Engineering Department's Official Newsletter



KUMARAGURU COLLEGE OF TECHNOLOGY

Department of Mechanical Engineering

Mechanical Engineering Association

REACH US AT

da.mec@kct.ac.in mea_kct MEAKCT meakct

EDITORS



Dr. P. S. Samuel Ratna Kumar
Assistant Professor - III & Head



Dr. B. N. Sreeharan
Assistant Professor – III

ASSOCIATE EDITORS



Ms. P. Kirubashini



Ms. S. Santhiya



Mr. T. K. Sri Yashwanth



Mr. N. S. Barath



Ms. K. Gayathri Sreha



Mr. P. G. Renith

CONTENTS

Details	Page
Editors' Portfolio	4
Departmental Activities	5
Programmes Organized	5
Paper Publications	7
Manuscript Reviewed	8
Books Published	8
Industry Linkages	8
Consultancy	12
Patents	13
MoU Activities	13
Faculty Participations	15
Student Activities	16
Snapshots	17
Vision, Mission, POs, PSOs and PEOs	19

EDITORS PORTFOLIO

From the Editors...

Dear Readers,

This edition of the newsletter highlights the department's sustained commitment to academic excellence, research advancement, and industry collaboration. A range of **Programmes Organized** enriched learning through expert interactions and skill-based initiatives, while notable **Paper Publications**, **Books Published**, **Patents**, and **Manuscript Reviews** reflected the department's strong research culture.

Active **Industry Linkages**, impactful **Consultancy projects**, and dynamic **MoU activities** strengthened academia–industry collaboration and real-world relevance. Faculty members demonstrated continuous professional growth through active **Participations** in FDPs, workshops, and conferences at national and international levels. Equally commendable were the vibrant **Student Activities**, showcasing innovation, research engagement, and holistic development.

This edition also captures key moments through curated **Snapshots**, presenting a concise visual narrative of achievements and collaborative efforts. Together, these accomplishments reflect the collective dedication of the department towards excellence, relevance, and impact.

Warm regards,
Editors





DEPARTMENTAL ACTIVITIES

Programmes Organized

An industry-led session on **“Design of Jigs and Fixtures & Product Design and Development”** was conducted on 25 February 2026 from 1:45 PM to 3:45 PM, offering students valuable exposure to real-world engineering practices. The session was delivered by **Mr. Marudhupandian M, CAE Engineer at TANCAM**, who shared practical insights into the application of finite element modeling in industrial scenarios, including design validation and performance analysis. The session enhanced students’ understanding of simulation-driven design and its importance in modern product development.





This session was organized in association with the courses U18MEE0550 – Design of Jigs and Fixtures and U18MEE0024 – Product Design and Development and was coordinated by **Mr. R. S. Mohankumar,** Assistant Professor - II **and Dr. M. A. Vinayagamoorthi,** Assistant Professor - III.





A guest lecture on **"Application of Finite Element Method to Solve Engineering Problems – A Case Study"** was successfully conducted at KCT on 27 February 2026 from 2:00 PM to 3:00 PM. The session was delivered by **Mr. Kishore Viswanathan, Designer – Product Development (R&D, IWDV12) at ZF Group, ZF Wind Power Coimbatore Pvt. Ltd.**, The session was coordinated by **Dr. M. Thirumalaimuthukumaran,** Assistant Professor - III, and was organized as part of the course U18MEI6203 – Finite Element Analysis.



A technical training program in collaboration with Capgemini was organized to strengthen students' core engineering knowledge and industry-relevant skills. The sessions covered a wide range of subjects including Dynamics of Machinery (DOM), Design of Machine Elements (DME), Manufacturing Technology (MT) with GD & T, Engineering Mechanics (EM), Kinematics of Machinery (KOM), Engineering Materials (EMM), Microsoft Excel for Data Analytics, and Strength of Materials (SOM). These sessions were handled by our faculty members, **Dr. N. Sangeetha, Mr. P. D. Devan, Dr. M. A. Vinayagamoorthi, Mr. T. R. Sukumar, Dr. T. Karuppusamy, Dr. B. Senthil Kumar, Dr. B. N. Sreeharan, and Mr. S. Subbiah.** The program was coordinated by **Dr. M. A. Vinayagamoorthi,** MEDA Coordinator.










Paper Publications

Faculty members have contributed significantly to high-quality research through reputable Scopus-indexed journals. These publications reflect the department's strong research culture and its focus on advancing materials engineering, robotics, and high-temperature applications.



A research paper entitled **"Central Composite Design/ANOVA-Based Analysis of EDM Parameters for Analyzing Surface Roughness in Aluminium Composites Using Design Expert Software"** was published in the *AIP Conference Proceedings* on **12 February 2026** (Vol. 3382, Article No. 060007). This study was carried out by **Dr. V. R. Muruganantham, Associate Professor**, along with his research team, focusing on the optimization of EDM parameters through statistical design techniques.



Another significant contribution titled **"Vision Transformers-Based Weld Imperfection Detection Framework for Quality Control"** introduces an advanced methodology for automated weld defect detection in industrial environments. This research was authored by **Mr. P. D. Devan, Assistant Professor - II**, highlighting the application of deep learning techniques for quality assurance in welding processes.





The research article **"Comparative Study of High-Speed Steel and Carbide Tools in Drilling of Aluminium Alloy 6061 Using Grey Relational Approach"** was published in the *AIP Conference Proceedings* on **20 February 2026** (Vol. 3385, Article No. 040014). The work was undertaken by **Dr. M. A. Vinayagamoorthi,** Assistant Professor - III and **Dr. V. Manivelmuralidaran**, Assistant Professor – III, presenting a comparative performance evaluation of drilling tools using multi-criteria decision-making techniques.



Additionally, a paper titled **"Carbon Nanotube-Reinforced Stacked Aluminium–Air Batteries for Electric Vehicle Applications"** was published in the *Journal of Testing and Evaluation* (**Vol. 54, No. 2, 2026, pp. 357–376**). Authored by **Dr. Samuel P. S. Ratna Kumar**, **HoD,** this study explores advanced energy storage solutions aimed at improving the performance of electric vehicle batteries.

Manuscript Reviewed

A manuscript titled "Microstructure and Mechanical Properties of Novel Ti-Cu-Co-Zr Complex Concentrated Alloys" was reviewed for the Materials Research Express journal by **Dr. B. N. Sreeharan**, Assistant Professor - III.



Books Published



A book titled "Principles of Edge Computing for Next-Generation Networks" was published by Dr. **K. K. Arun,** Assistant Professor – III and his team. The book focuses on the fundamentals and applications of edge computing in modern network systems.

Industry Linkages

The Department actively strengthened its industry engagement through a series of **industry visits** conducted in **February 2026**, focusing on quality enhancement, digital transformation, and operational excellence.

❑ **MechMak CNC India Pvt. Ltd., Coimbatore**



An **industry visit** was organized on **19th February 2026** to **MechMak CNC India Pvt. Ltd., Balaji Industrial Estate, Saravanampatti, Coimbatore**. The visit focused on understanding the **requirements for implementing 5S methodology** in the company's newly established manufacturing plant.



Faculty Involved: Mr. K. Manikanda Prasath, Assistant Professor - II

- **Ellem Engineering, Jothi Engineering & Srihari Kitchen Equipments Pvt. Ltd.**

On **17th February 2026**, faculty members visited **Ellem Engineering**, **Jothi Engineering**, and **Srihari Kitchen Equipments Pvt. Ltd.** to support quality and process improvement initiatives. The interaction emphasized **strengthening quality control processes**, the **need for systematic inspection procedures**, and support for **documentation and standardization practices**.

Faculty Involved: Dr. V. Muthukumaran, Professor, **Dr. S. Balaji,** Assistant Professor – III, **Dr. M. Thirumalai Muthukumaran,** Assistant Professor – III, **Dr. V. R. Muruganantham,** Associate Professor, **Mr. K. Manikanda Prasath,** Assistant Professor – II.



Intero Pactec India Pvt. Ltd. & Autoplates

An **industry visit** was conducted on **10th February 2026** to **Intero Pactec India Pvt. Ltd.** and **Autoplates**. Discussions centered on the **digitalization of engineering drawings**, improvements in the **inventory management system**, structured **data storage and retrieval**, and **new product development support**.

Faculty Involved: Dr. V. Muthukumaran, Professor, **Dr. S. Balaji,** Assistant Professor – III, **Mr. K. Manikanda Prasath,** Assistant Professor – II.



GR Engineering & VRN Engineering

Faculty members visited **GR Engineering** and **VRN Engineering** on **13th February 2026** to explore collaborative opportunities. The visit identified requirements for **student internship opportunities**, **engineering drawing review and optimization**, and improved inspection accuracy through **CMM utilization**.

Faculty Involved: Dr. V. Muthukumaran, Professor, **Dr. S. Balaji,** Assistant Professor – III, **Dr. N. Sangeetha,** Senior Associate Professor, **Dr. V. R. Muruganantham,** Associate Professor, **Mr. K. Manikanda Prasath,** Assistant Professor – II.



Sri Sivasakthi Metal Works

An **industry visit** was conducted on **4th February 2026** to **Sri Sivasakthi Metal Works** as part of the follow-up for an industry-sponsored final year project titled *"Design and Development of an Automated Conveyor System for Inspection and Segregation of Carbide Insert Tools."* The visit aimed to review project progress, ensure alignment with industrial requirements, and provide technical guidance.





The interaction was led by **Dr. N. Sangeetha, Senior Associate Professor**, along with industry mentor **Mr. K. Kavin Mathi**, and included discussions on conveyor design, inspection methods, system integration, feasibility, safety, and operational efficiency. The visit strengthened academia–industry collaboration and reinforced the project's relevance to real-time industrial automation.

PSG TIFAC-CORE, PSG College of Technology, Coimbatore

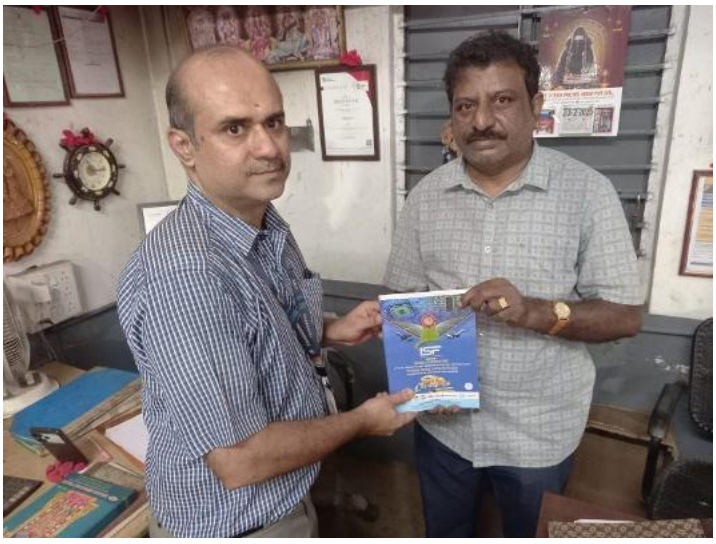
An **industrial visit** was organized on **13th February 2026** to **PSG TIFAC-CORE, PSG College of Technology, Coimbatore** for **B.E. (Hons) students** as part of the course *U18MEE0012 – Additive Manufacturing*. The visit provided hands-on exposure to advanced **CAD/CAM facilities**, **rapid prototyping technologies**, and **product design and development practices**. Students gained insights into liquid-based, solid-based, and powder-based rapid prototyping systems, along with reverse engineering and advanced materials.





The visit was coordinated by **Dr. M. Thirumalai Muthukumaran**, Assistant Professor – III and offered valuable industry-oriented learning aligned with the course objectives.

Consultancy



A **consultancy project** was successfully completed for **M/s Auto Plates, Coimbatore**, by **Dr. B. N. Sreeharan, Assistant Professor – III**, as part of the department's initiative to promote **digital transformation and sustainable manufacturing practices**.



The project involved the development of a **customized Excel-based application** for maintaining detailed **inspection reports for electroplating processes**, enabling effective monitoring on **daily, monthly, quarterly, and annual levels**, along with **bath-wise and operator-wise analysis**. The implemented solution enhanced **process traceability, data accuracy, and quality control.** This consultancy also demonstrated a **cost-effective and scalable digital solution** tailored for MSMEs, supporting accessible and practical industry digitalization.

Patents



A **design application** (Application No. **480838-001**) was filed with **Intellectual Property India** under **CBR No. 225536** dated **19 November 2025**. The application was submitted by **Dr. K. K. Arun,** Assistant Professor – III and his team which has been **accepted**.



A **patent application** titled *"Intelligent Micro-extrusion System with Adaptive Process Control"* (Application No. **202641018970 A**) was filed in India on **19th February 2026** and published on **27 February 2026**. The application was submitted by **Mr. R. S. Mohan Kumar,** Assistant Professor - II and is applicable to **mechanical, electronic, and biomedical manufacturing domains**.

MoU Activities

Dr. V. R. Muruganantham, Associate Professor, **Mr. P. Devan**, Assistant Professor – II and **Mr. B. Jeeva,** Assistant Professor – II, visited **M/s. L. R. Fabrications Pvt. Ltd., Coimbatore**, on **21st February 2026** to renew the **MoU** and explore further collaboration. Discussions focused on **industry participation in curriculum development**, **research consultancy**, and partnership with the **KI–Centre for Energy Systems Engineering (KI-CESE)**, including support for a **postgraduate diploma in the energy domain**. The company agreed to provide **resource persons**, sponsor **educational models for boiler and pressure vessel assembly**, and support academic activities using **PV-Elite software**.



The MoU was successfully renewed with updates reflecting the company's **ASME certification** and revised branding.



A Memorandum of Understanding (MoU) was signed with **Blue Star Limited** on **23rd February 2026** to strengthen **industry–academia collaboration in HVAC (Heating, Ventilation, and Air Conditioning)**. As part of the partnership, a **dedicated HVAC training center** will be established at KCT, with **Blue Star providing technical expertise, equipment, and trainers**, while **KCT manages laboratory operations**. This initiative aims to enhance students' practical skills, support national skill development goals, and improve industry readiness through hands-on training and real-world exposure. **Dr. P. S. Samuel Ratna Kumar,** HoD, **Dr. V. Muthukumaran,** Professor and **Dr. S. Ramanathan,** Assistant Professor – III coordinated the event.



Faculty Participations

Faculty members of the Department of Mechanical Engineering actively participated in various **international and state-level training programs, webinars, competitions, and professional development activities** during February 2026, emphasizing continuous learning and skill enhancement.



Mr. K. Manikanda Prasath, Assistant Professor II, completed an **international online training program** on *"Digital Maturity Diagnostic Framework"* conducted by **Dx-EDGE** on **4th February 2026**, gaining insights into digital transformation assessment strategies.

Dr. V. Manivel Muralidaran, Assistant Professor - III, completed an online course on *"Primary and Secondary Batteries"* and *"Lithium Based Batteries"* conducted by **Coursera** during **February 2026**, enhancing his knowledge in energy storage technologies.





Dr. M. A. Vinayaga Moorthi, Assistant Professor – III, completed two **online courses** titled *"Introduction to Jig and Fixture Design"* on **11th February 2026** (Manufacturing Skills Academy) and *"Geometric Dimensioning and Tolerancing Basics"* on **16th February 2026** (Udemy), strengthening his expertise in manufacturing design practices.

Dr. B. N. Sreeharan, Assistant Professor – III, completed an online course on *"Decision Making with Data"* conducted by **SAS** through **Coursera** on **27th February 2026**, focusing on data-driven analytical approaches.





Mr. P. D. Devan, Assistant Professor – II, completed an online course on *"Hybrid Electric Vehicles Technical System"* conducted by **Coursera** on **23rd February 2026**, gaining insights into modern automotive powertrain systems.



Dr. M. Thirumalai Muthukumaran, Assistant Professor – III, participated in the **AAKRUTI Innovation Competition 2025**, an **international design contest** organized by **Dassault Systèmes**, on **28th February 2026**, showcasing innovation and design thinking.





Mr. K. Arumugham, Senior Technical Associate participated and won the first prize in chess competition in the **State-Level Faculty Sports Competition** held at **Kalaignar Karunanidhi Institute of Technology** on **14th February 2026**, representing the institution and promoting staff engagement beyond academics.

Student Activities

Mr. S. Haribala, II Year, received a Certificate of Participation for the 13th Edition of the GKDC (Go Kart Design Challenge), recognizing his involvement in the design and engineering of a go-kart. The competition provided hands-on experience in CAD/CAE-based design and simulation, fabrication processes such as welding and assembly, and compliance with technical inspection standards for safety and performance.

Mr. S. Pranesh, Mr. P. Sheik Abdul Kalam, and **Mr. Shree Hari,** II Year students, participated in the National Level Ideathon'26 organized by SNS Institutions (SNS College of Arts and Science) from 25 to 27 February 2026. The event focused on fostering innovative thinking, teamwork, and problem-solving skills, providing students with a platform to collaborate and present creative ideas.

Mr. S. Deepakumar, II Year student secured First Prize in the GLIDATHON (Design & Simulation) event at Titanium 2026 – India's Biggest Tech Fest, hosted by Rajalakshmi Engineering College from 12 to 14 February 2026. The achievement highlights his strong skills in aerodynamic design, simulation, and optimization, demonstrated through effective application of engineering tools and principles.

Ms. M. Vaeshnave, II-year student was awarded Runner-up at the Tenkasi Hackathon (Residential Bootcamp & Grand Finale), organized by StartupTN in association with the Tenkasi District Administration and District Industries Centre, and supported by J.P. College of Engineering and MSME Business Incubation. The event, held on 6th and 7th February 2026 at J.P. College of Engineering, Tenkasi, recognized her innovation, technical skills, and problem-solving ability demonstrated during the competition.

SNAP SHOTS



Industry Led Session – Mr. Marudhupandian M, TANCAM



Third Year Students at PSG - TIFAC CORE.



MoU renewal with M/s. L. R. Fabrications Private Limited, Coimbatore

Vision, Mission, POs, PSOs and PEOs

KUMARAGURU college of technology
COIMBATORE – 641 049

Institute Vision:

The vision of the college is to become a technical university of International Standards through continuous improvement.

Institute Mission:

Kumaraguru College of Technology (KCT) is committed to providing quality Education and Training in Engineering and Technology to prepare students for life and work equipping them to contribute to the technological, economic, and social development of India. The College pursues excellence in providing training to develop a sense of professional responsibility, social and cultural awareness and set students on the path to leadership.

Department of Mechanical Engineering

Department Vision*:

To achieve global recognition for the programs of the department by promoting innovation, sustainability, and leadership, contributing to the society.

Department Mission*:

1. To promote innovation in the Mechanical Engineering through curriculum, focusing on sustainability and ethical practices.

2. To create an active learning ecosystem for acquiring knowledge and skills in Mechanical Engineering.

3. To facilitate research in mechanical systems and sustainable technologies that have an impact on industry and society.

** Focused SDGs are: 4, 8, 9, 12, 13, 17*

B. E. MECHANICAL ENGINEERING

Program Educational Outcomes (PEO's):

PEO 1: Graduates to pursue careers in Mechanical engineering and allied fields.

PEO 2: Graduates to engage in the execution of multi-disciplinary engineering activities.

PEO 3: Graduates to pursue professional development programs in Mechanical Engineering Science and Management.

Program Outcomes (PO's):

1. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

4. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Engineering Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. The Engineer and The World: Apply contextual knowledge to assess societal, health, safety, legal, cultural, and environmental issues, and demonstrate the knowledge of and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics, responsibilities, and norms of engineering practice, including inclusive and diverse behavior.

8. Individual and Collaborative Teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

9. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, including writing reports, design documentation, making presentations, and giving/receiving clear instructions.

10. Project Management and Finance: Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments.

11. Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change, including adaptability and tech awareness.

Program Specific Outcomes (PSO's):

1. Apply the fundamentals of science and mathematics to solve complex problems in the field of design and thermal sciences.

2. Apply the concepts of production planning and industrial engineering techniques in the field of manufacturing engineering.

M. E. INDUSTRIAL ENGINEERING

Program Educational Objectives (PEO's):

PEO 1: Graduates will be mid to higher level management / engineering professionals with responsibilities in engineering management, data analysis and business operations.

PEO 2: Graduates will be engineering professionals, and technology leaders who would manage such functions as plant engineering, production, supply chain and quality management.

PEO 3: Graduates would function as educators or researchers in academic institutions.

Program Outcomes (PO's):

PO1 : An ability to independently carry out research /investigation and development work to solve practical problems.

PO2 : An ability to write and present a substantial technical report/document.

PO3 : Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.

PO4 : Apply knowledge and competencies in manufacturing, analytics, supply chain, quality and engineering management.

PO5 : Apply principles of industrial engineering to solve problems in industry.

PO6 : An ability to work as part of interdisciplinary teams, communicate effectively, model and design engineering systems optimally.