

MEXPRESS

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Mechanical Engineering Association
Department of Mechanical Engineering
KUMARAGURU COLLEGE OF TECHNOLOGY



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From the Editors...

Dear Readers,

Welcome to an encapsulation of our department's journey over the past month. This newsletter paints a vivid picture of our collective achievements and aspirations.

Programmes & Events:

Our institution thrived with a diverse array of events, from enlightening seminars to hands-on workshops, culminating in the success of Yugam 2024—a celebration of innovation and collaboration.

Academic Achievements:

Our esteemed faculty have been guiding lights, reflected in numerous paper presentations and publications. Our Ph.D. scholars' accomplishments and rigorous academic reviews attest to our commitment to scholarly pursuits.

Research & Scholarly Pursuits:

Collaborations with industries have yielded impactful patents and consultancy projects. Faculty have also contributed significantly to scholarly literature through manuscript reviews and insightful book chapters.

Recognition & Engagement:

Faculty accolades and active participation in professional societies underline our dedication to excellence. These efforts contribute to our institution's continued growth and recognition.

Student Engagements:

Our students are at the heart of our institution, participating actively in events and producing exceptional articles, showcasing their talent and dedication.

As we look back on a month of growth, we eagerly anticipate the opportunities ahead. Together, we continue to thrive as a center of excellence in education. Thank you for being a part of this journey.

Warm regards,

Editors....



PROGRAMMES ORGANIZED:



Dr. P. S. Samuel Ratna Kumar, Assistant Professor - III, coordinated the Yugam Paper Presentation event organized by IE(I) Students chapter of KCT on 21-03-2024.



A programme on “Traveling towards our goal” was organized by the department for selected 2nd year mechanical engineering students on 07-03-2024. **Mr. Praveen Khanna**, Senior Global Supply Manager, Apple Inc, Kuperitino, California, United States was the resource person. **Dr. V. Muthukumar**, Professor, coordinated the programme.



Department Activities



Couple of workshops on “Data handling for academic data base management system (ADBMS)” was organized by the department on 13-03-2024 and 14-03-2024 for the faculty members and staff members respectively. **Dr. B. N. Sreeharan**, Assistant Professor – III, was the resource person and coordinated the workshops.

Department Activities



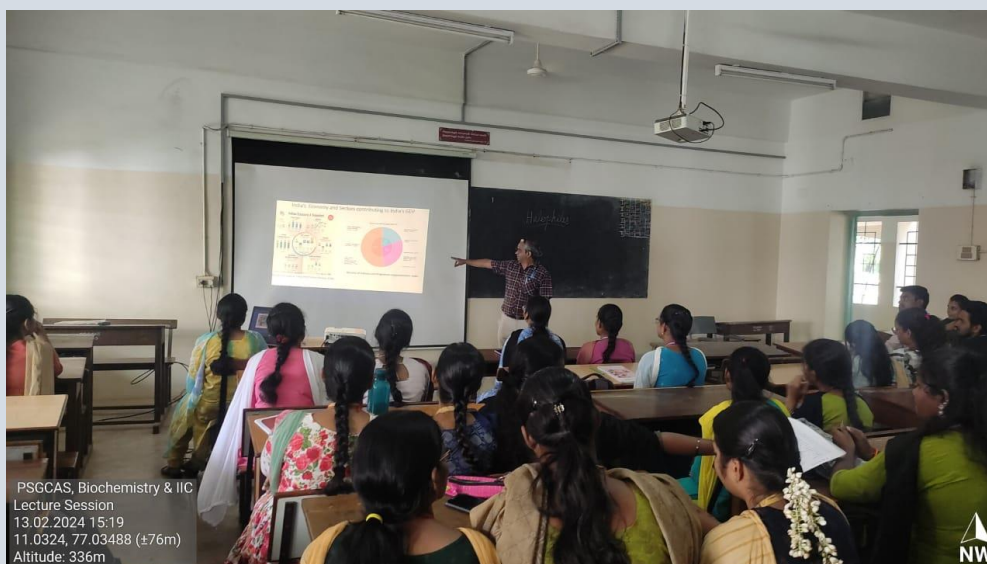
A one-day seminar on Modern trends in Air Conditioning was organized by the department on 19-02-2024. Sessions on Modern trends in Air Conditioning was delivered to the students by **Mr. S. Kalyan**, Senior General Manager, Blue Star limited and **Mr. SA Srihari**, Territory Manager Commercial Air-conditioning Division Blue Star limited. Seminar was coordinated by **Mr. P. Pradeep**, Assistant Professor – II, **Mr. S. Prabhu**, Assistant Professor – II, and **Dr. S. Rajesh**, Assistant Professor – II.



FACULTY AS RESOURCE PERSONS:



Dr. B. N. Sreeharan, Assistant Professor – III, was the Resource Person in the ICSSR Sponsored Two-Day National Seminar on Innovative Research Practices in social sciences/ Breaking Boundaries Advancements in social science research Sri Krishna Arts and Science College on 12-03-2024. He delivered a guest lecture on “Data Analytics and Visualization in Social Science Research”



Mr. B. Jeeva, Assistant Professor – II, has acted as a Resource Person and delivered a talk on “Innovation and Entrepreneurship Focus in Education” in the session organized by Department of Biochemistry in association with Institution’s Innovation Council of PSG College of Arts and Science, Coimbatore on 13-02-2024.



PAPER PRESENTATIONS:

Dr. M. Balaji, Associate Professor, presented a paper entitled “Comparative Studies on Adoption of Circular Economy Practices Across Indian Manufacturers” at Recent Advances in Industrial and Systems Engineering (RAISE), an International Conference organized by Vellore Institute of Technology, Vellore during 20-12-2023 to 22-12-2023.



PAPER PUBLICATIONS:



Dr. V. R. Muruganatham, Associate Professor, published his paper entitled “Parametric Optimization in Turning Process of Galvanized Iron Metal using Taguchi Based Six Sigma Technique”, ISSN: 0022-2755, in the Scopus indexed Journal of Mines, Metals and Fuels.

Dr. S. Balaji, Assistant Professor – III, **Dr. K. M. Senthilkumar**, Associate Professor and **Dr. V. Muthukumar**, Professor published their paper entitled “Effect of Chemically Pretreated Water Hyacinth Co-Digested with Poultry Litter in Anaerobic Digestion”, ISSN: 1662-9752, Vol. 1111, pp 119-126 in the Scopus indexed Materials Science Forum Journal. The same team published their paper entitled “Development of Compact Medical Aspirator with IoT Applications, ISSN: 1662-7482, Vol. 920, pp 103-109 in the Applied Mechanics and Materials Journal. They also published another paper entitled, “Study on Influence of Core Structure on Catalytic Converter Performance Using CFD, ISSN: 1662-7482, Vol. 920, pp 95-102 in the same journal. One paper entitled “Development of Compact Medical Aspirator with IoT Applications, ISSN: 1662-7482, Vol. 920, pp 103-109” was published by them in the Applied Mechanics and Materials.



Dr. M. Thirumalai Muthukumar, Assistant Professor – III and **Dr. V. R. Muruganatham**, Associate Professor, published the following papers in the Applied Mechanics and Materials Journal, ISSN: 1662-7482, Vol. 920.



“An Approach to Reduce Production Lead Time in the Valve Manufacturing Industry”, pp 167-174.
“Implementation of 5s Concept to Improve Productivity in a Fabrication Industry”, pp 175-180.
“Implementation of an Automatic Polishing Process with a Conveyor Mechanism”, pp 129-139.





Dr. B. N. Sreeharan, Assistant Professor – III, published paper entitled “Effective Cleaning of Water Can using Semi-automatic System”, Volume 07 Issue 01 in the Transactions on Innovations in Science and Technology Journal.



Dr. V. Manivel Muralidaran, Assistant Professor – III and **Dr. S. Thirumurugaveerakumar**, Associate Professor published their paper entitled “Literature Review on Under Water Welding, Volume 11, Issue 1 in the International Journal of Research and Analytical Reviews.



MANUSCRIPTS REVIEWED:



Dr. M. Thirumalai Muthukumar, Assistant Professor – III, reviewed a manuscript titled “Inner surface smoothing for prototype manufacturing of fluid - flowing channels based on comprehensive precision enhancement” for a SCI indexed International Journal the Engineering Manufacture

BOOK CHAPTER PUBLICATIONS:

Dr. P. S. Samuel Ratna Kumar, Assistant Professor – III, published a book chapter titled “Friction Stir Welding Characteristics of Dissimilar/Similar Ti-6Al-4V-Based Alloy and Its Machine Learning Techniques” in the book titled ‘Advanced Joining Technologies’ published by Taylor & Francis, pp. 227-243, ISBN No. 9781032356358.



Ph. D. COMPLETED:



Mr. G. Krishna Kumar, Research Scholar of **Dr. C. Velmurugan**, Professor and HoD, bearing Reg. No. 1314269184, successfully defended his research work during his Ph. D. Viva Voce conducted on 15-03-2024 under Anna University, Chennai

INDUSTRY LINKAGE:



Dr. A. P. Arun, Assistant Professor – III and **Dr. M. A. Vinayagamoorthi**, Assistant Professor – III, participated in the Innovation Product Exhibition, “K-INNOV-XPO 2024”, hosted by Institute Innovation Council (IIC) on 07-03-2024.



FACULTY RECOGNITION:

Mr. K. Manikanda Prasath, Assistant Professor – II, was recognized with a Certificate of Excellence in Peer - Reviewing by B P International.



CONSULTANCY:



Mr. B. Jeeva, Assistant Professor – II, provided consultancy to Mr. G. M. Madhavan, Department of Biotechnology, Kumaraguru College of Technology, Coimbatore by Biodiesel sample testing and Water cooking oil and waste coconut oil testing for Rs. 590/-. He also provided consultancy on good will basis on Aluminium Air battery exhaust gas testing Gas chromatography to Mr. Moulidharan N, B. E. Automobile Engineering Student of KCT. Also on Thermal Imaging for sleeping bag comfort using Thermal Image camera to Mr. Monish. K (20BFT014) Final Year Student Department of Fashion Technology, KCT and Thermal imaging for Ti-O₂ coated silicon wafers using the same Thermal Image to Dr. R. Prakasam, AP-III/ SFS/KCT.



Dr. M. Balaji, Associate Professor, visited Emerald Jewel Industry, Rakkipalayam, Coimbatore on 03.04.2024 for providing consultancy.

PATENT:



A patent titled "Design and Development of Loading and Unloading System for Light Commercial Vehicles" bearing application no. 202441023206 was filed by **Dr. V. Muthukumaran**, Professor on 24-03-2024.

PROGRAMMES PARTICIPATED:

Dr. V. Muthukumaran, Professor completed following four online courses through Coursera.



1. Electric Vehicles and Mobility from 05-02-2024 to 21-03-2024
2. Industrial Biotechnology from 19-02-2024 to 25-03-2024
3. How Things Work: An Introduction to Physics from 07-02-2024 to 19-03-2024
4. Advanced Engineering Systems in Motion: Dynamics of Three Dimensional (3D) Motion from 19-02-2024 to 18-03-2024

Further, he participated in a FDP on "Recent Trends in Multidisciplinary Research" from 07-07-2023 to 18-07-2023 organized by SRM Institute of Science and Technology, Chennai.



Mr. S. Prabhu, Assistant Professor – II, participated in Physical Round (Phase 3) of eBAJA – BAJA SAEINDIA 2024, organized by SAEINDIA from 06-03-2024 to 09-03-2024 at B V Raju Institute of Technology, Narsapur.

Dr. A. P. Arun, Assistant Professor – III, participated in an online FDP on "Fusion Ventures: The Accelerated Path to Entrepreneurship Success" from 29-01-2024 to 23-02-2024 organized by Academy of Maritime Education and Training, Deemed to be University, Chennai.



Mr. S. Sivakumar, Assistant Professor – II, participated in a FDP on "Nanotechnology for sustainable growth and development" from 08-01-2024 to 13-01-2024 organized by IEEE Nanotechnology Council and KCT at KCT, Coimbatore.



Dr. N. Sangeetha, Senior Associate Professor, and **Mr. P. D. Devan**, Assistant Professor – II, completed an online course on "Nature and Properties of Materials" from 22-01-2024 to 24-03-2024 through NPTEL. He also participated in an online FDP on "The Smart and Sustainable Manufacturing - The new Era of Manufacturing, from 19-02-2024 to 23-02-2024 organized by Government Polytechnic College, Chekkanurani.



Dr. S. Rajesh, Assistant Professor – II, participated in a FDP on “Nanotechnology for sustainable growth and development” from 08-01-2024 to 13-01-2024 organized by IEEE Nanotechnology Council and KCT at KCT, Coimbatore.



Dr. M. Balaji, Associate Professor, participated in an online FDP on “The Smart and Sustainable Manufacturing - The new Era of Manufacturing, from 19-02-2024 to 23-02-2024 organized by Government Polytechnic College, Chekkanurani. He also completed a online course on Teaching And Learning in Engineering (TALE) from 22-01-2024 to 17-02-2024 through NPTEL. Further, Dr. Balaji participated in a FDP on “Precision Manufacturing” from 08-01-2024 to 13-01-2024 organized by PSG College of Technology, Coimbatore.

Dr. S. Thirumurugaveerakumar, Associate Professor, participated in a FDP on “Nanotechnology for sustainable growth and development” from 08-01-2024 to 13-01-2024 organized by IEEE Nanotechnology Council and KCT at KCT, Coimbatore.



Dr. S. Sivakumar, Assistant Professor – III, participated in a Seminar on “Solid Edge University 2024” on 22-02-2024 at The Residency Towers, Coimbatore. He also participated in a Workshop on “Energy Management Methods” on 28-02-2024 at COINDIA Coimbatore.

Mr. P. Pradeep, Assistant Professore – II, participated in a FDP on “Nanotechnology for sustainable growth and development” from 08-01-2024 to 13-01-2024 organized by IEEE Nanotechnology Council and KCT at KCT, Coimbatore.



Dr. B. Senthilkumar, Associate Professor, participate in an International conference on UIMAGE TN Global Conference on 23-02-2024 and 24-02-2024 organized by Information Technology and Digital Services Department at Chennai Trade Center.

Mr. B. Jeeva, Assistant Professor – II, participated in a FDP on “Nanotechnology for sustainable growth and development” from 08-01-2024 to 13-01-2024 organized by IEEE Nanotechnology Council and KCT at KCT, Coimbatore.



PROFESSIONAL SOCIETY:

The Institution of Engineers (India) membership was renewed from December 2023 to December 2024. The process is coordinated by **Dr. P. S. Samuel Ratna Kumar**, Assistant Professor – III.



EQUIPMENT PURCHASED:

A Tear Down Table – MS with PC was purchased for Rs. 61,596/- for the NPD Lab on 01-03-2024 through purchase order no. PO23-24/A0256 for the purpose of Academic, Research and Consultancy.

YUGAM 2024

Thrill Trek Xtreme - Event

Thrill Trek Xtreme event was organized on 22-03-2024. It was coordinated by **Dr. M. A. Vinayagamoorthi**, Assistant Professor III, **Dr. V. R. Muruganatham**, Associate Professor, **Mr. B. Akshay Kanna**, Research and Innovation Coordinator, MEA, **Mr. S. Harshit**, Executive member, MEA, **Ms. V. Kamalikka**, Executive member, MEA.

The first round of the event was conducted with a Logo Quiz where students had to find the name of the brands and logos displayed. The second round of the event is the treasure hunt begins where the organizers have hidden several clues for the participants to find out on their own and to connect the dots to leading them to one of the two treasures, a ring, and a sword. Whichever treasure, i.e Ring or Sword, is found first, will be considered as the first-place winner and the second found will be considered the second-place winner.



All the attendees found the event extremely fun and engaging. They were interested to find out the clues and to find the treasure. Overall, the participants had a fun time and were eagerly engaged in finding the treasure.

Automotive Manufacturing Technology - Workshop

As a part of Yugam 2024, a techno-cultural sport event, department organized a workshop on “Automotive manufacturing technology” on 20-03-2024. The workshop was coordinated by **Dr. M. A. Vinayagamoorthi**, Assistant Professor III, **Dr. V. R. Muruganatham**, Associate Professor, **Mr. S. Karthikeyan**, Deputy General Manager, Wheels India, **Mr. S. Sathishkumar**, Media manager, MEA, **Mr. S. Aruthra**, Joint Secretary Extra Curricular, MEA and **Ms. S. Priyanka**, Executive member, MEA.



Workshop was organized to give a detailed insights about the automotive manufacturing in areas of wheels of all kind and air suspensions that are used in modern day buses and tractors. **Mr. S. Karthikeyan** from Wheels India, Chennai hosted a workshop. He explained in detail of how wheels India got into the market and how it grew over the time and what products and made in the industry and the process. He also explained how an engineer need to think to produce a product in an effective way in consideration to the market demand. He also explained how the automobile industry evolved over centuries and what technology will come to this industry.

Many of the attendees felt this workshop so useful for their career growth in a manufacturing sector and felt the air suspension session could have extended and explained more. Everyone who attended the workshop got an idea of how the industry works and what other products are manufactured by Wheels India company. They also gained knowledge about how automotive industry evolved over centuries.

CAD XTREME - Event

An event CAD XTREME, a computer-based modelling competition was organized by the department on 21-03-2024 as a part of the Yugam 2024, a techno-cultural sports event. The event was coordinated by **Dr. M. A. Vinayagamoorthi**, Assistant Professor III, **Dr. V. R. Muruganatham**, Associate Professor, **Dr. B. N. Sreeharan**, Assistant Professor – III, **Mr. N. Gokulakrishnan**, Joint Treasurer, MEA, **Ms. S. Swetha**, Executive Member, MEA, and **Mr. M. Kesavdarshan**, Technical Ambassador, MEA.

The objective of this event is to enhance skills, promote innovation, foster networking, and showcase advancements in the field of computer-based modelling. The CAD modelling event featured multiple rounds assessing participants' proficiency in CAD software and practical skills. Highlights include a quiz round testing theoretical knowledge, an engineering drawing round focusing on interpretation and accuracy, and a CAD modelling round requiring the creation of 3D models based on provided specifications. Participants faced challenges in modelling complex

Department Activities

shapes and assemblies while judges evaluated accuracy, efficiency, and creativity. The event aimed to gauge participants' overall CAD proficiency across various aspects and levels, providing a comprehensive assessment platform for their skills in CAD software and engineering drawing interpretation.



Participants were satisfied with the event. They appreciated skill development opportunities and found the event relevant. Judges provided constructive feedback, leading to overall positive reception with suggestions for enhancements. Participants gained valuable experience and skills in CAD software usage and practical application. Overall, the event succeeded in promoting CAD proficiency and providing a platform for showcasing talent and expertise.

NEW PRODUCT DEVELOPMENT - WORKSHOP

Another workshop as a part of Yugam 2024 on “New Product Development” was organized by the department on 19-03-2024. The workshop was coordinated by **Dr. M. A. Vinayagamoorthi**, Assistant Professor III, **Dr. V. R. Muruganatham**, Associate Professor, **Mr. B. Surendren**, Manager, Capgemini, **Mr. V. Bragadheswar**, Lead Engineer, Capgemini, **Mr. K. Nithyanantham**, Manager, Capgemini, **Mr. Zuhair Mohammed**, Lead Engineer, Capgemini, **Mr. Raghavendra Nadgouda**, Senior Manager in Design, Capgemini, **Mr. Sandeep Kumar**, Manager in Thermal and CFD Engineering, Capgemini, **Mr. Vijay Adithya**, Design Coordinator, MEA, **Ms. P. Kirubashini**, Joint Secretary, MEA, **Mr. Merun Kumar**, Executive Member, MEA.

Objective of this workshop is to equip participants with comprehensive knowledge on New Product Development through interaction with industrial experts. The event commenced around 10:00 AM following a warm welcome address.



Department Activities

The morning session, led by the Consumer Team from Capgemini, featured presentations by **Mr. Surendran** and **Mr. Nithyanantham**, both managers, along with **Mr. Bragadheswar** and **Mr. Zuhair Mohammed**, lead engineers. Their presentations delved into various aspects of consumer-focused product development.



In the afternoon, the stage was led by **Mr. Raghavendra Nadgouda**, Senior Manager in Design, and **Mr. Sandeep Kumar**, Manager in Thermal and CFD Engineering of Capgemini. Their session was highly engaging, focusing on aircraft development and digitalization, garnering active participation, and sparking insightful discussions among the attendees.

Throughout the day, the workshop remained highly interactive, with participants exchanging ideas and perspectives on new product development. The event concluded successfully around 4:30 PM, leaving participants enriched with valuable insights and practical knowledge in the field of new product development. The students were highly satisfied through this workshop, and they had a productive time by interacting with the experts in the field. The participants enhanced their knowledge in the field of New Product Development, through this workshop.

RC Xtreme - Event

RC Xtreme event was organized on 23-03-2024. It was organized by **Dr. T. Karuppusamy**, Assistant Professor - III, **Mr. U. Suriya Prakash**, Executive Member, MEA, **Mr. S. Smith**, Executive Member, MEA, and representatives from LGB Rolon Chains Limited, Coimbatore. The main objective of the RC Xtreme event is that it aimed to provide a platform for students to showcase their engineering prowess, compete against peers and demonstrate their skills and ability to tackle challenges. It also aimed to promote interest in STEM fields and encourage collaboration between students from different academic backgrounds.



“RC Xtreme” is a highlighted event of Yugam 2024 conducted by Mechanical Engineering Association and RC Forum of Kumaraguru Institutions. It featured three rounds including a trial round from 10:00 am to 5:00 pm of participants from various colleges. LGB Rolon & Chains Private Limited was a main sponsor and Chief Guest of this event. Winners were announced after the event. Highlights included intense competition, impressive performances by the teams, and networking opportunities for all attendees. Key data includes the number of rounds, participating teams, guests, and audiences.

The feedback for the event was that the event was planned and executed without any flaws and the members of the MEA and RC Forum found that this would improve their management and leadership skills. The participants were able to showcase their engineering skills in RC Event. The Audience were interested to see RC racing and that sparked interest of participants to involve and learn about RC Racing.

Structural Analysis & Fluent using ANSYS – A hands-on Workshop.

Workshop was organized on 18-03-2024. It was coordinated by **Dr. M. A. Vinayagamoorthi**, Assistant Professor III, **Dr. V. R. Murugantham**, Associate Professor, **Dr. N. Sangeetha**, Senior Associate Professor, **Mr. G. G. Naveen**, Career Progression Coordinator, **Ms. S. Santhiya**, Executive Member, MEA, **Mr. B. Nitin**, Executive Member, MEA

Structural Analysis Workshop aims to break down intricate structures into manageable elements, offering insights into stress, strain, and performance metrics using Ansys Software. The workshop was an informative one for the participants from various college, the workshop provided an in-depth exploration of Computational Fluid Dynamics (CFD) and Finite Element Analysis (FEA), key tools in engineering simulations. Participants engaged in practical sessions using Ansys software to understand how these techniques can solve complex fluid flow and structural problems. Through hands-on exercises, attendees gained insights into applying CFD and FEA in diverse engineering fields, such as aerospace, automotive, and civil engineering. The workshop emphasized the significance of these tools in predicting fluid behaviour and structural responses, aiding in design optimization and cost reduction.



Department Activities

Some of the key points discussed:

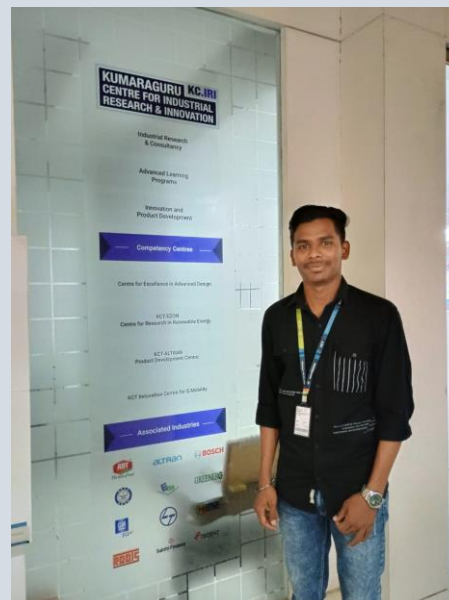
- Introduction to Computational Fluid Dynamics (CFD)
- Introduction to Finite Element Analysis (FEA)
- Practical Sessions using Ansys Software
- Application Across Engineering Fields
- Significance in Design Optimization
- Preparation for Real-World Challenges

The participants appreciated the workshop's thorough coverage of CFD and FEA fundamentals, which deepened their understanding of engineering simulations. They found the practical sessions particularly beneficial for honing their skills in solving intricate fluid flow and structural issues. Participants felt equipped with valuable tools to tackle real-world challenges and drive innovation in their respective fields, expressing gratitude for the enriching experience. Deep understanding of CFD and FEA, essential for engineering simulations were given to the participated and made them to tackle real-world engineering challenges and contribute to innovation in their field of interest.

STUDENT PARTICIPATIONS:

Mr. R. Deepak, 21BME017, presented his paper titled "Review of carbon nanotubes (CNT) used in coaxial cable in space vehicles" in the International Conference on Mechanical Engineering Design on 21-03-2024 organized by Sri Sivasubramaniya Nadar College of Engineering. He was guided by **Dr. P. S. Samuel Ratna Kumar**, Assistant Professor – III.

Mr. T. Suresh, 23PME01R, participated in a state level Marathon, "Run for Native Tribes 2024 KCTBS Marathon" on 03-03-2024.



Mr. R. Kavin Kannan and **Mr. K. L. Arun** was offered a three-month internship at Kumaraguru Centre for Industrial Research and Innovation starting from 11.03.2024. During the intern he will be working in the design and development of a rubber bladder project.

Mr. T. N. Mithun, 22BME059, along with **Mr. K Krisnan**, 21BME211, **Mr. P. Shrikanth**, 22BME099, and **Mr. S. Sriganesh**, 22BEE098 participated in International Inter Varsity Innovation Challenge 2023 from 01-11-2023 to 08-12-2023 through online and won silver medal for presenting their innovative solution on "Optimization of Compressed Air Energy Storage System for Better Efficiency".

Mr. T. N. Mithun, **Mr. S. Sriganesh**, 22BEE098, **Mr. P. Suganthan**, 21BCE117, and **Mr. P. Sudalaimuthu Suresh**, 20BME112 presented their paper titled "A Novel Approach Towards a Sustainable Energy Storage: Vacuum Based Energy Storage" in the 2nd International Conference on Water, Energy & Environment [WEECON 2023] conducted on 29th & 30th December 2023, organized by ISET Research India in association with Maejo University Thailand & Saigon University Vietnam through online.

Mr. K. S. Vigneshraja, **Mr. P. Shrikanth**, 22BME099, **Mr. S. Kalanathi**, 21BME042 and **Mr. P. Sudalaimuthu Suresh**, 20BME112 presented their paper titled "Enhancing Solar Panel Efficiency through Wind-driven Cooling: A Computational Study" in the 2nd International Conference on Water, Energy & Environment [WEECON 2023] conducted on 29th & 30th December 2023, organized by ISET Research India in association with Maejo University Thailand & Saigon University Vietnam through online.

STUDENT ARTICLE

FIXED WING DRONES



Ms. P. Kirubashini
II Mech. 'A'

In this article, we will explore about the fixed-wing drones. So, to begin with what is a fixed-wing drone? Fixed-wing drone has been designed in such a way that one of its wings is rigid and looks and functions like that of an aeroplane. This drone gets its lift due to its design and not because of vertical lift rotors.

The fixed-wing drones have a lot of merits. To start with, this only requires energy to propel, and not to hold itself in the air and hence, it is highly energy efficient. These drones are capable of covering very large distances and stay in the air for more than 16 hours. It can fly at high altitudes and is more stable in the air. This type of drone can carry various payloads and data-link equipment.

These drones do have their own demerits. Firstly, these are quite expensive. Secondly, training is a requisite to fly these. Generally, it is difficult to put the drone in hover as it always moves faster and is a lot quicker. Often launchers are required to get the drone into the air.

So where are these drones used? These drones find their technical uses in aerial mapping, agriculture, inspection, construction and security purposes. These are also used in drone surveying of pipeline, coastal areas, forest areas, etc. Fixed-wing drone is a fascinating invention, isn't it?



KUMARAGURU
college of technology

COIMBATORE – 641 049

Department of Mechanical Engineering

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 VISION:

To emerge as a centre, that imparts quality higher education through the programme in the field of Mechanical Engineering and to meet the changing needs of the society.

DEPARTMENT MISSION:

The department involves in sustained curricular and co-curricular activities with competent faculty through teaching and research that generates technically capable Mechanical Engineering professionals to serve the society with delight and gratification.

B. E. MECHANICAL ENGINEERING

PROGRAM EDUCATIONAL OUTCOMES (PEO's):

- PEO 1 :** Graduates will take up career in manufacturing and design related disciplines.
- PEO 2 :** Graduates will be involved in the execution of Mechanical Engineering projects.
- PEO 3 :** Graduates will take up educational programme in mastering Mechanical sciences and management studies.

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 the specified needs with appropriate consideration for the public health and safety, and the 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. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **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.

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.
- PEO3 :** Graduates would function as educators or researchers in academic institutions.

PROGRAM OUTCOMES (PO's):

- P01 :** An ability to independently carry out research /investigation and development work to solve practical problems.
- P02 :** An ability to write and present a substantial technical report/document.
- P03 :** 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.
- P04 :** Apply knowledge and competencies in manufacturing, analytics, supply chain, quality and engineering management.
- P05 :** Apply principles of industrial engineering to solve problems in industry.
- P06 :** An ability to work as part of interdisciplinary teams, communicate effectively, model and design engineering systems optimally.