

MEXPRESS

DECEMBER 2023

Mechanical Engineering Department's Official Newsletter
Volume No. 07 Issue No. 04
For Internal Circulation Only



REACH US AT



Mechanical Engineering Association
Department of Mechanical Engineering
KUMARAGURU COLLEGE OF TECHNOLOGY



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From the Editors...

Dear Readers,

Greetings!

It brings us immense pleasure to share with you the highlights of the diverse activities that have shaped our department during last month. Our commitment to fostering a vibrant learning environment has been reflected through various programs, initiatives, and achievements.

We take pride in the array of impactful programs organized by our department. From workshops and seminars to conferences, these events have served as platforms for intellectual exchange and growth. The engagement and enthusiasm displayed by both students and faculty have truly been commendable.

Our esteemed faculty members continue to contribute their expertise as resource persons in various events and forums. Their participation underscores our commitment to academic leadership and knowledge dissemination.

The academic prowess of our faculty is evident in the numerous research papers published in esteemed journals. These publications not only contribute to the body of knowledge in their respective fields but also showcase the research culture embedded in our institution.

Our faculty's dedication to peer review is a testament to their commitment to maintaining high academic standards. The rigorous review process ensures the quality and credibility of scholarly work within our academic community.

Celebrating the accomplishments of our faculty, we acknowledge the publication of books that contribute significantly to the literature in their disciplines. These publications underscore our commitment to advancing knowledge and scholarship.

Participation in external programs has been a constant feature, providing our students and faculty with exposure to diverse perspectives and the latest developments in their fields.

Our affiliation with professional societies continues to grow, providing a platform for networking, collaboration, and staying abreast of industry trends. The recent visit of our esteemed alumnus has not only been nostalgic but have also enriched the current student experience. His insights and success stories serve as inspiration to our current students.

A glimpse into the vibrant life of our department through snapshots captures moments of academic rigor, creativity, and camaraderie. These snapshots tell stories of our shared journey and accomplishments.

Our students continue to actively participate in various co-curricular and extracurricular activities, showcasing their talent, leadership, and commitment to holistic development. We applaud the achievements of our students, be it in academics, sports, or other domains. Their success reflects their hard work and the nurturing environment provided by our institution.

Editors' Portfolio

The successful placement of our students in esteemed organizations is a testament to their skills and the quality of education they receive here. We take pride in being a stepping stone to their professional success.

Internships play a crucial role in bridging the gap between theory and practice. We are delighted to see our students gaining valuable industry exposure through internships, preparing them for the challenges of the professional world.

The literary prowess of our students shines through in the various articles they contribute to publications, both within and outside the institution. These writings showcase their critical thinking and articulation skills.

In conclusion, these achievements and activities stand as markers of our dedication to academic excellence, innovation, and holistic development. As we celebrate our successes, let us also look forward to the challenges and opportunities that lie ahead, collectively steering our department toward greater heights.

Wishing everyone a productive and fulfilling year ahead!

Best regards,

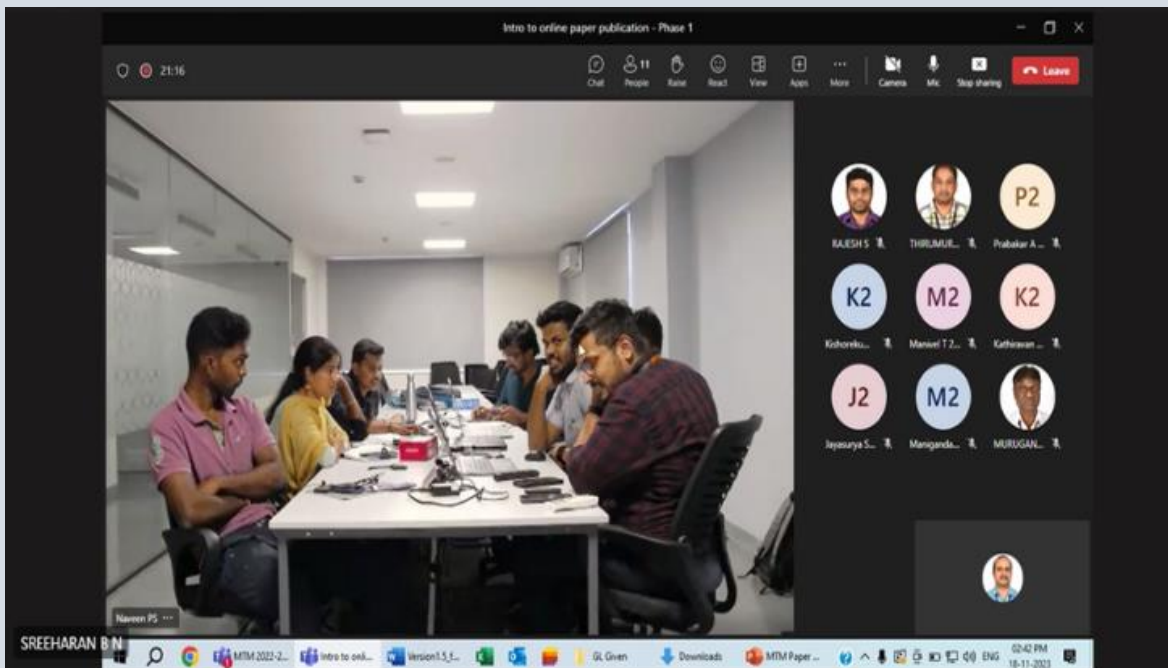
Editors....



PROGRAMMES ORGANIZED



Installation Ceremony of Mechanical Engineering Association was organized on 02-11-2023. **Mr. Partha Kumar Sarkar**, Head of Operations and Digital Initiatives at M/s. ZF Coimbatore Plant was the resource person. **Dr. V. Muruganatham**, Associate Professor and **Dr. M. A. Vinayagamoorthi**, Assistant Professor - II were the coordinators.



Department Activities



A webinar on “Introduction to journal paper publication - Phase -1” was organized on 18-11-2023 for the PG Technology Management students of M/s. Ashok Leyland, Hosur. **Dr. B. N. Sreeharan**, Assistant Professor – II, was the resource person. **Dr. V. R. Muruganatham**, Associate Professor and **Dr. B. N. Sreeharan**, Assistant Professor – II were the coordinators.



Another Seminar titled “Unleashing Industrial Engineering” was organized on 02-11-2023. **Mr. Nagarethnam**, Senior Management Consultant, CPC was the resource person. **Dr. V. Muruganatham**, Associate Professor and **Dr. M. A. Vinayagamoorthi**, Assistant Professor - II were the coordinators.



FACULTY AS RESOURCE PERSONS:



Mr. S. Prabhu, Assistant Professor – II, delivered a Guest Lecture on “Boundary Layer Concepts” at SNS College of Engineering on 26-10-2023.



Dr. S. Bhaskar, Associate Professor, was the Special Invitee for the Academic Council by the Governing body at Sri Shanmugha College of Engineering and Technology, Salem on 07-11-2023.

Mr. K. Manikanda Prasath, Assistant Professor – II, delivered a Seminar on Supply Chain Management at SNS College of Engineering on 01-11-2023.



Dr. B. N. Sreeharan, Assistant Professor – II was the resource person for a seminar on “Unveiling the research paper writing and crafting your quest for knowledge” at Kumaraguru College of Technology on 07-11-2023 and for a webinar on “Introduction to journal paper publication - Phase -1 on 18-11-2023 for the PG Technology Management students of M/s. Ashok Leyland, Hosur. Further, he also acted as resource person for a seminar on “Unlocking the Secrets to Exam Excellence” on 21-11-2023 for the UG student of KCT.

Dr. K. K. Arun, Assistant Professor – III, acted as External Examiner for the Practical Examination conducted at Government College of Technology, Coimbatore on 07-11-2023.



Dr. M. Thirumalai Muthukumaran, Assistant Professor – III acted as External Examiner for end semester question paper scrutiny board at Dr. Mahalingam College of Engineering and Technology on 08-11-2023.

Dr. V. R. Muruganatham, Associate Professor, acted as External Examiner for the Question Paper Scrutiny at Dr. Mahalingam College of Engineering and Technology on 08-11-2023.



Dr. P. R. Ayyappan, Assistant Professor (SRG), acted as external examiner for the End Semester Practical Examination at Government College of Technology, Coimbatore on 09-11-2023 and on 22-11-2023.



Dr. N. Sangeetha, Senior Associate Professor, acted as External Examiner for the End Semester Practical Examination at Government College of Technology, Coimbatore on 09-11-2023.

Dr. P. S. Samuel Ratna Kumar, Assistant Professor, acted as external examiner for the project viva voce Phase I at Kumaraguru College of Technology on 15-11-2023.



Dr. K. M. Senthilkumar, Associate Professor, acted as external examiner for the End Semester PG Practical Examination at Bnnari Amman Institute of Technology, Sathy on 06-11-2023.

PAPER PUBLICATIONS:

The following faculty member published his paper as detailed below in the Scopus indexed AIP Conference Proceedings.

	Dr. S. Thirumurugaveerakumar Associate Professor	Design and prototyping of adjustable fixture for valve body
		Buckling load and part of mild carbon fiber reinforced PLA parts

Further, **Dr. Thirumurugaveerakumar**, published his manuscript titled "Design and Analysis of an Integrated Conveyor System with Robotic Arm for Automated Anode Replacement" in the Volume 10, Issue 4 of the International Journal of Research and Analytical Reviews (IJRAR).

MANUSCRIPTS REVIEWED:

Dr. V. Manivel Muralidaran, Assistant Professor – III, reviewed a manuscript titled "Effect of Adding Urtica Dioica Chopped Fiber on Load Bearing, Fatigue and Water Absorption Behavior of Rock Dust Dispersed Vinyl Ester Composite" for the Scopus indexed International Journal Biomass Conversion and Biorefinery.



Department Activities



Dr. P. S. Samuel Ratna Kumar, Assistant Professor, reviewed the following manuscripts for SCI indexed International Journals: (1) Microstructural Characteristics and Material Failure Mechanism of SLM Ti-6Al-4V-Zn Alloy for the Materials (2) Facile Construction of versatile cotton fabrics with robust hydrophobicity, self-cleaning and oil water separation for the Fibers and Polymers.

BOOKS PUBLISHED:

Dr. V. Manivel Muralidaran, Assistant Professor – III published a book on “Fundamentals of Robotics” published by Scientific International Publishing House, 978-93-5757-949-0.

PROGRAMMES PARTICIPATED



Dr. K. K. Arun, Assistant Professor - III, participated in a Workshop on "Effective Use of Virtual Labs" on 07-11-2023, organized by Amrita Vishwa Vidyapeetham, Coimbatore.

Dr. S. Thirumurugaveerakumar, Associate Professor, participated in an FDP on "Embedded Systems" on 09-11-2023, organized by KCT, Coimbatore.



Mr. B. Jeeva, Assistant Professor - II, participated in a Seminar on "Startup funding in India" on 28-11-2023, organized by Turnip Innovations Pvt. Ltd, Coimbatore.

Mr. K. Manikanda Prasath, Assistant Professor - II, participated in a Training on "Machine Value Added products from Millets" on 21-11-2023, organized by Tamil Nadu Agricultural University, Coimbatore.



Mr. P. Karthi, Assistant Professor - I, completed a Course on "Azure Fundamentals" on 24-11-2023, organized by Microsoft, Coimbatore.

PROFESSIONAL SOCIETY



On 23-11-2023, CPC Institutional membership renewal was done with total of 75 students' members. The activity was coordinated by Dr. V. R. Muruganatham, Associate Professor.

ALUMNI VISIT



Mr. Sathish Kumar (12BME138) of batch 2012-2016 who is currently the Director of Sales, Directshifts.com visited the department on 16-11-2023 for providing placement for a few students of final year Mechanical Engineering and KCT Business School.

SNAPSHOTS



Mechanical Engineering Installation Ceremony

Department Activities



Dr. V. R. Muruganantham and Dr. B. N. Sreeharan during webinar on “Introduction to journal paper publication - Phase -1”



Participants during the seminar on “Unleashing Industrial Engineering”

PARTICIPATIONS:

- Following students from the department volunteered in "Vanam Kappom (Madhukarai Cleaning) Camp" on 27-10-2023 as a part of National Service Scheme (NSS) Club

20BME224 **Mr. Kathiravan S V**
20BME259 **Mr. Vaanmugilan M**
22BME027 **Mr. Giriprasath R**
22BME105 **Mr. Sree Ram G**

- Following students from the department participated in FMAE Moto Student event from 26-10-2023 to 02-11-2023 as a part of TEAM Moto, KCT and Team Zeal, KCT

22BME043 **Ms. Kamalika M**
22BME088 **Mr. Sanjaykumar S**
22BME102 **Ms. Sivathiruthani S**
22BME117 **Ms. Swetha S**
22BME120 **Ms. Thiruvazhagi E**
22BME126 **Mr. Yogesh S**
21BME095 **Mr. Varun M P**

- **Mr. Sudalaimuthu Suresh P**, 20BME112, **Mr. Ajmal Batcha S**, 22BME004 and **Mr. Jai Harish D**, 22BME040 participated in Start - up Showcase Event in 6th INAE - SERB - GITAM Youth Conclave from 03-11-2023 to 04-11-2023 organized by GITAM Deemed to be University.

- **Mr. T. Suresh**, 23PME01R, Research Scholar of the department as a part of his research work visited M/s. Apex EDM Tools, Coimbatore on 06-11-2023 and PSGR Krishnammal College for women, Coimbatore on 07-11-2023.

- **Mr. Shakeel Akthar**, 20BME104 and **Mr. Sudalaimuthu Suresh P**, 20BME112 participated in India's Biggest Innovation Challenge "Gets Even Bigger" from 03-11-2023 to 05-11-2023 organized by icreate Association, Gujarat, Ahmedabad

- **Mr. Joel David**, 20BME219 volunteered for the event "Innovesta" which is a one-day boot camp for school students on 17-11-2023 at Government High School, Valayapalayam, Erode as a part of the IEEE project.

- Following students of department visited Sulur Air Force Station as a part of NCC -AIRWING on 07-11-2023 and 08-11-2023.

22BME053 **Mr. Manick Ajith S**
22BME097 **Mr. Thayanidhi S**

ACHIEVEMENTS:

Mr. Sudalaimuthu Suresh P, 20BME112 and **Mr. Kalanithi S**, 22BME042 participated in a Competition on 30-10-2023 and 31-10-2023 conducted as a part of International Workshop on Ocean Energy - Recent Trends at IIT Madras and won 2nd prize.

Mr. Mithun T N, 22BME059 and **Mr. Shrikanth P**, 22BME099 participated in a competition "Ideathon" on 03-11-2023 and 04-11-2023 conducted as a part of 6th INAE - SERB - GITAM Youth Conclave at GITAM Deemed to be University and won 3rd Prize.

Mr. Karunamoorthi A, 22BME046 and **Mr. Manikandan M**, 22BME055 participated in a competition "Auto Quiz" on 22-11-2023 conducted as a part of SAEINDIA and won 1st Prize.

Mr. Harshit S, 22BME037 and **Mr. Kamalikka V**, 22BME044 participated in a competition "Auto Quiz" on 22-11-2023 conducted as a part of SAEINDIA and won 2nd Prize.

Placement Updates:

1. **Ms. Anjana Prasad** 20BME013 has been placed in Collins Aerospace-GETCI.
2. **Ms. Jobisha Celin A** 20BME051 has been placed in Cameron, SLB, Coimbatore.
3. **Mr. Jaishankar S** 22BME047, **Mr. NavinKarthik** GG 22BME077, **Mr. Subramanian M** has been placed in MUSIGMA, Bangalore.
4. **Mr. Kaarthik Raja J** 20BME056, has been placed in Unschool, Hyderabad.
5. **Mr. Keerthivasan** 20BME060, has been placed in Ampo Valves.
6. **Mr. Ananthu Krishna GV** 20BME012, has been placed in RNTBCI, Chennai and Brakes India.
7. **Mr. Sam Tirshath** 20BME098, has been placed GEP Solution.
8. **Mr Joel David** 20BME219, has been placed in Renault Nissan and Titan Engineering and Automation Ltd (TEAL).

Internship Updates:

Mr. Vidhun C R is selected for doing a semester long senior design (capstone) project at Department of Industrial and Systems Engineering at Northern Illinois University (NIU), Unites States from January – May 2024.

MECHANICAL TECHNIQUES IN NANOPARTICLE SYNTHESIS



Ms. P. Kirubashini
II Mech. 'A'

The discovery of nanoparticles has never ceased to amaze us. Its various applications are indeed wonderous. Nanotechnology plays an integral role in the mechanical sector by increasing the life of components and automobile parts. It's application in the heavy industries, aerospace sectors and fuel cell technologies are inevitable. Though nanoparticles are produced by various methods like gas condensation, vacuum deposition and vaporisation, sol-gel techniques etc, in

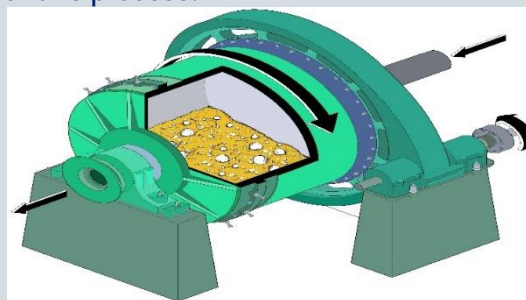


Ms. S. Santhiya
II Mech. 'B'

this article, we will explore more about the mechanical method of nanoparticle preparation and what makes it stand out.

The mechanical process used in the synthesis of nanoparticles is known as attrition. From the historical perspective, the attrition or milling has been used in ceramic processing and powder metallurgy for many years. Slowly the mechanical attrition found its way in blending and commuting of metal powders in a technique called Mechanical Alloying. Now a days, the attrition or milling, has offered great benefits including increased quantity, flexibility of structures in the production of nanostructured powders. It is also possible to make advanced materials using this process. Most recently, ceramic/ceramic nano-comp WC-14% MgO material has been fabricated using this process.

For the production of nanoparticles using mechanical attrition, "top down" approach is utilised. Here, mechanical device known as mills do the job, wherein the energy is provided to a coarse-grained material which in turn reduces the particle size. The result of attrition is particulate powders exhibiting nano structural characteristics in two levels- nano crystals and nanoparticles. Nanoparticles possess dimension less than 100 nm while the nanocrystals are crystallites with size ranging from 1 nm to 10 nm. Machines such as ball mills, vibratory ball mills, planetary ball mills are commonly used for this process.



Attrition Mills

The mechanical milling has its one big disadvantage of being very sensitive to external contamination. To overcome this, Mechanochemical Processing has been developed and here, a conventional ball mill can be utilised as a low temperature chemical reactor. Nanotechnology is an ever-growing field. Integrating its production and utilisation with mechanical streams can offer a wide range of scope. Today much research is being carried out tirelessly around the world in this sector. Bringing out innovation in its production techniques as a mechanical engineer is an exciting challenge, isn't it?



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.