

# E.G.S. Pillay Engineering College

An Autonomous Institution Affiliated to Anna University, Chennai | Approved by AICTE, New Delhi  
Accredited by NAAC with A Grade | Accredited by NBA T1 (B.E. – CSE, B.E. – ECE & B.Tech – IT)  
Old Nagore Road, Thethi, Nagore Village, Nagapattinam – 611002, Tamil Nadu, India

## DEPARTMENT OF MECHANICAL ENGINEERING

### *NEWS LETTER*



### **MECHBEEZ**

*JANUARY 2022- DECEMBER 2022*

*VOLUME-10*

*ISSUE-1*

Website: <https://www.egspec.org/newsletter.php>

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## **SECRETARY MESSAGE**



**Mr.S.Senthil Kumar**

**Secretary**

**EGSP GROUP OF INSTITUTION**

It's with great pride that I witness the growth and dedication of MechBeez-22 in fostering a culture of excellence in Mechanical Engineering. Your enthusiasm and commitment to learning and innovation are commendable. As we embark on another fruitful year, I encourage you to seize every opportunity to expand your knowledge and skills. Together, let's continue to push the boundaries of what's possible in our field.

# Principal message



**Dr.S.Ramabalan, ME.Ph.d**

**Principal**

**E.G.S PILLAY ENGINEERING COLLEGE**

I am delighted to extend my warm greetings to all the members of the Mechanical Engineering community as we present the latest edition of Mechbeez-22 . This newsletter stands as a testament to the hard work, creativity, and dedication of our students and faculty, who continuously strive for excellence in the field of Mechanical Engineering.

As we navigate through an era marked by rapid technological advancements and innovative breakthroughs, it is essential for us to stay informed and engaged with the latest developments. Mechbeez-22 serves as a crucial platform for sharing knowledge, celebrating achievements, and fostering a sense of unity within our department.

In this edition, you will find insightful articles, research highlights, and updates on various events and activities that have taken place over the past months.

I would like to take this opportunity to commend our students for their active participation in these events and for their commitment to academic and professional growth. Your enthusiasm and hard work are truly inspiring and play a significant role in shaping the future of our institution.

I also extend my heartfelt appreciation to our dedicated faculty members who mentor and guide our students, ensuring they receive the best possible education and training. Your unwavering support and dedication are the backbone of our success.

# HOD'S MESSAGE



**Dr.G.Gurumoorthi ME,Ph.d**

**Professor/Head of the department**

**EGSPEC**

I am delighted to present the Mechbeez '22 newsletter, highlighting the outstanding work and achievements within our department. This year, we have focused on fostering innovation and excellence through various initiatives, including seminars, workshops, and research projects.

Our students' dedication and enthusiasm have been truly inspiring, and our faculty's unwavering support has been invaluable. Together, we have made significant strides in advancing our knowledge and skills. Let us continue to push boundaries, inspire each other, and strive for excellence in all our endeavors.

## **Vision**

*To foster academic excellence in Mechanical Engineering Education and Research and turn out students into competent professionals to serve the society.*

## **Mission**

Mechanical Engineering department is committed to

M1: To produce successful mechanical engineers through innovative teaching and learning processes and by enhancing the knowledge and skills of faculty members and supporting staff through various training programmes.

M2: To establish state-of-the-art laboratories and centers of excellence to promote good quality education, research and consultancy for industrial and societal needs.

M3: To prepare the students for higher education and successful engineering careers by inculcating leadership and entrepreneurial qualities, team work capability, interpersonal skills, lifelong learning, moral and ethical values..

## **About the Department**

The department of Mechanical Engineering was established in 1995. The department offers a under graduate B.E. (Mechanical Engg.) and a Post Graduate M.E. (Manufacturing Engg.) programmes. The department has approved as research centre by Anna University and Annamalai University. The department has highly qualified and experienced faculty. The department has well infrastructural facilities and has fully equipped laboratories with adequate hardware and software. The teaching faculties are active in conducting research and publishing the papers in reputed Journals and Conferences. The department has conducted six International Conferences and four AICTE sponsored Faculty Development Programs.

## **PROGRAM EDUCATIONAL OBJECTIVES (PEOs)**

**PEO 1:** Preparing the graduates to have successful career in mechanical and associated industries or becoming an entrepreneur or pursuing higher education and research.

**PEO 2:** Developing ability to apply fundamental technical knowledge and skills to find practical solutions to technological challenges and problems in core and allied areas of mechanical engineering.

**PEO 3:** Complementing the class room teaching with live projects, field works, seminars to build self-learning, and lifelong learning capability, and to develop out of box thinking. Also, developing capability to adapt to evolving technological challenges, communicate effectively, work effectively as individuals and as team members and adhering to professional ethics..

## **PROGRAM OUTCOMES (POs)**

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

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

**PO 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.

**PO 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.

**PO 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.

**PO 6: The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO 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.

**PO 8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO 9: Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO 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.

**PO 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.

**PO 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 (PSOs)**

**After successful completion of the programme, Graduates will be able to**

PSO1: Design, develop, test and maintain advanced thermal engineering systems for industrial and other applications.

PSO2: Apply the concepts of modern manufacturing and industrial engineering techniques in industries.

PSO3: Modeling, design and analysis of mechanical components using Computer Aided Design and Analysis software tools.



## STUDENT PARTICIPATION

Mr.S.Ashok,Mr.S.Aakash,Mr.R.Kalidas,Mr.A.Jagadheeswaran,Mr.A.Gokulraj,Mr.G.JanakiRaman **Third year** mechanical engineering were attended a one day workshop titled “**Workshop On Advanced Composites For Aerospace Applications**” conducted by **SASTRA UNIVERSITY ,THANJAVUR** on **25.02.2022**

Mr.G.Kesavan **Third year** mechanical engineering were attended a one day workshop titled “**Robotics And Automation**” conducted by **ARIFA INSTITUTE OF TECHNOLOGY** on **28.04.2022**

Mr.S.Saminathan ,Mr.H.Mohamed Rasool Fahith ,Mr.M.A Mohamed Mucksith **Second year** mechanical engineering were attended a one day workshop titled “**Workshop On E Vehicle Design**” conducted by **MEC COIMBATORE** on **05.08.2022**

Mr.N.Ramkumar ,Mr.A.Deena,Mr.S.Dharun **Third year** mechanical engineering were attended a one day workshop titled “**Recent Research Trends In Non-Destructive Testing**” conducted by **SAVEETHA SCHOOL ENGINEERING,CHENNAI** on **12.02.2022**

Mr.K.Abinash,Mr.V.Murukesh,Mr.V.Nitharshan,Mr.S.,Abinash,,Mr.M.SandheepMr.K.Saravanakumar,Mr.R.VenkatRamanan **Second year** mechanical engineering were attended a one day workshop titled “**Recent Research Trends In Non-Destructive Testing**” conducted by **SAVEETHA SCHOOL ENGINEERING,CHENNAI** on **15.02.2022**

Mr. X. Remigious Jayanathan **Third year** mechanical engineering were attended a one day workshop titled “**Friction Assisted StirTechnology (FAST-2022)**”conducted by **ANNAMALAI UNIVERSITY,CHIDAMBRAM** on **05.02.2022**

## NPTEL

**Mr. C.Venkatesh**, a Third-year student, started an 8-week course titled “**PRINCIPLES OF INDUSTRIAL ENGINEERING**” offered by **NPTEL** in January 2022. He completed the course successfully in March 2022.

In July 2022, **Ms.S.Bavadharini ,Mr.M.Navin,Mr.M.Sandeep,Mr.X.Remigious Jayanathan** all third-year students, commenced an 8-week course titled “**AUTOMATION IN MANUFACTURING**” offered by **NPTEL**. They successfully completed the course in Oct 2022.

**Mr.Thirumurugan** , a Third-year student, started an 8-week course titled “**BASICS OF FINITE ELEMENT ANALYSIS**” offered by **NPTEL** in July 2022. He completed the course successfully in sep 2022.

**Mr.S.Ganesh** , a second-year student, started an 8-week course titled “**PRINCIPLE OF VIBRATION CONTROL**” offered by **NPTEL** in July 2022. He completed the course successfully in august 2022.

# INTERNSHIP

## INPLANT-TRAINING

### INPLANT-TRAINING/INTERNSHIP

Mr.R.Akash ,Mr.S.Hariharan ,Mr.A.Mohamedashiq ,Mr.G.Rahul,Mr.S.Sudarshan,,Mr.M.Yogesh,Mr.R.Yogesh from Third year mechanical students completed their in-plant training in **SHIVA MOTORS,THANJAVUR** from 28/11/22 TO 02/11/22.

Mr.S.Aakash,Mr.R.Gowdham,Mr.A.Gokulraj,Mr.G.Janakiraman,Mr.V.Vishal from Third year mechanical students completed their in-plant training in **SOUTHERN RAILWAY,PONMALAI** from 04/04/22 To 09/04/22

Mr.R.Abdhul Hadhi,Mr.P.Abinash,Mr.S.Hariharan,Mr.K.Kamalesh,Mr.Jayaram Prakash,Mr.C.Venkatesh from Third year mechanical students completed their in-plant training in **SOUTHERN RAILWAY,PONMALAI** from 07/03/22 To 12/03/22

Mr.R.Praneesh Arunraj,Mr.K.Srikanth from Third year mechanical students completed their in-plant training in **KASHIV INFOTECH** from 14.02.2022 TO 19.02.2022



SOUTHERN RAILWAY,PONMALAI



SHIVA MOTORS,THANJAVUR



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Dr. S. Krishnamohan, published a research article in SCOPUS titled “Optimization of Water Absorption and Mechanical and Thermal Behavior of Polylactic Acid/Chitosan/Titanium Carbide” on January 2022.

Dr.N.Ramanujam published a research article in SCIE titled “Experimental Investigations on Mechanical Properties of AZ31/Eggshell Particle-Based Magnesium Composites” on Jan-2022.

Dr.V.Navaneetha Krishnan published a research article in SCI titled “Modeling tensile modulus of nanoclay filled ethylene-propylene –diene monomer/styrene –butadiene rubber using composite theories” on January 2022.

Dr. S. Krishnamohan, Dr.N.Ramanujam, Mr.G.Sundravadivel published a research article in SCOPUS titled “Evaluation of shallow and deep neural networks for steel surface defect detection” on January 2022

Dr.S.Ramabalan published a research article in SCOPUS titled “Metaheuristic Based Resource Scheduling Technique for Distributed Robotic Control Systems.” on January 2022.

Dr.S.Ramabalan published a research article in SCOPUS titled “Synthesis and diffraction, computational exposure, hardness and interaction studies of EN2MNYM3NA crystalline material for mechanized, electronic and bio utilities” on January 2022.

Dr.S.Ramabalan published a research article in SCOPUS titled “Impact of mixed tolerance combination on the geometric position and torques of a four-bar kinematic chain using genetic algorithm” on January 2022

Dr.S.Ramabalan published a research article in SCOPUS titled “Advanced power optimization of worm gear drive with profile shift using nature inspired algorithms” on February 2022.

Mr.G.Sundravadivel, Dr.S.Krishnamohan, published a research article in SCIE titled “Slurry erosion behaviour of eco-friendly surface modified pump casings used in coal mines” on January 2022.



Dr. S. Krishnamohan, published a research article in SCOPUS titled “Optimization on Tribological Behaviour of AA7075/Zirconium Boride Composites Using Taguchi Technique” on May 2022.

Dr.S.Ramabalan published a research article in SCIE titled “Mobile robot path planning using fuzzy enhanced improved multi-objective particle swarm optimization (FIMOPSO)” on July 2022.

Dr.S.Krishnamohan published a research article in SCIE titled “Visible-light driven  $\gamma$ -Al<sub>2</sub>O<sub>3</sub>, CuO and  $\gamma$ -Al<sub>2</sub>O<sub>3</sub>/CuO nanocatalysts: Synthesis and enhanced photocatalytic activity” on July 2022

Dr. S. Krishnamohan, published a research article in SCIE titled “Influence of sic particles on wear of az91 composites fabricated through eco-friendly diffusion bonding” on JULY 2022.

Dr.S.Ramabalan published a research article in SCIE titled “Design optimisation of mating helical gears with profile shift using nature inspired algorithms” on August 2022.

Dr.S.Krishnamohan published a research article in SCIE titled “Influence Of Sic Particles On Wear Of Az91 Composites Fabricated Through Eco-Friendly Diffusion Bonding” on October 2022.

Dr.S.Krishnamohan published a research article in SCOPUS titled “Electric Discharge Machining of AZ91 Magnesium Hy” on November 2022.

Mr.K. Senthilnathan published a research article in SCOPUS titled “Mobile robot path planning using fuzzy enhanced improved multi-objective particle swarm optimization (FIMOPSO)” on November 2022.

### PATENTS

In 2022, **Dr. S. Krishnamohan** received a patent for his work on "Underwater Robots Design and Control Mechanism Using Particle Swarm Optimization Algorithm." This method uses the Particle Swarm Optimization (PSO) algorithm to enhance the efficiency and performance of underwater robots. His research represents a major advancement in underwater robotics.

In 2022, **Dr.S.Chockalingam** published a patent titled "Agridrone: A Dynamic Web-Based Drone Driven Crop Yield Estimation Model for Agriculture Farms." This patent introduces a web-based model that uses drones to estimate crop yields on agricultural farms.



# PARTICIPATIONS & ACHIEVEMENTS

## FACULTY- FDP/NPTEL

**Mr.G.Sundaravadivel** attended 4 weeks Faculty development program Titled “**Polymer Assisted Abrasive Finishing Processes**” conducted by **NPTEL** from July 2022 to August 2022.

**Dr.N.Ramanujam, Mr.A.Arunkumar, Dr.V.Sivaraman,Dr. M. Kathiresan** were attended the six days Faculty development program Titled “**Futuristic Research in Mechanical Engineering**” conducted by **SRM Institute of science and technology** from 08.08.2022 to 13.08.2022

**Dr.S.Ramabalan,Dr.S.Krishnamohan,Dr.N.Ramanujam** attended the Five days Faculty development program Titled “**Advanced materials processing and characterization methods**” conducted by **NIT PUDUCHERRY** from 26.12.2022 to 30.12.2022.

## FACULTY ACHEIVEMENTS



**Mr. G. Sundaravadivel**, currently serving as an Assistant Professor in the Department of Mechanical Engineering, successfully completed his doctoral research On 03.11.2022. His PhD thesis, conducted under the guidance of **Dr. S. Krishna Mohan**, Professor in the department, explored “**INFLUENCE OF SURFACE ENGINEERED COATINGS ON THE EROSION BEHAVIOUR OF PUMP CASINGS**” This significant academic endeavour underscores Mr. Sundaravadivel's dedication to advancing knowledge in his field and contributes valuable insights to the realm of Mechanical Engineering.



**Mr. A. Arunkumar's** recent accomplishment in completing his doctoral research on December 08, 2022, marks a significant milestone in his academic journey. His PhD thesis, conducted under the guidance of **Dr.S. Krishnamohan**, Professor in the Department of Mechanical Engineering, focused on the topic “**DESIGN AND EVALUATION OF MULTI WHEEL STEP CLIMBING ROBOT USING OPTIMIZATION TECHNIQUES.**”

## WORKSHOP ORGANIZED

### Summary Report

**Workshop Title:** Analysis of CRDI diesel engine characteristics

**Date:** 13.04.2022

**Delivered by:** Dr. G. Gurumoorthi, Professor, Mechanical Engineering.

#### **Objective:**

The primary objective of the workshop titled "Analysis of CRDI diesel engine characteristics" was to:

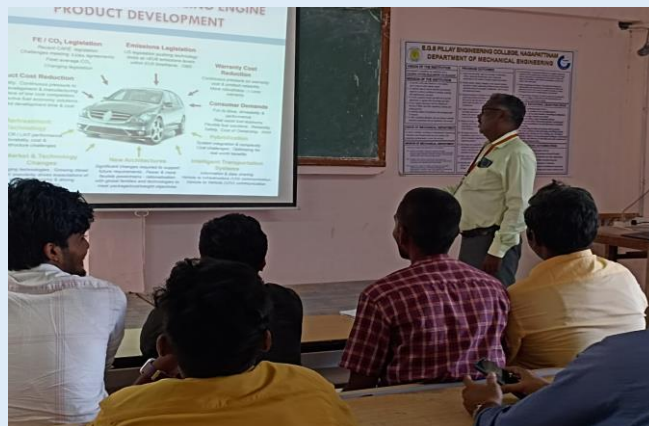
1. Provide faculty members with new teaching strategies and methodologies to enhance student engagement and learning outcomes.
2. Foster collaboration and knowledge sharing among faculty members from different departments.
3. Introduce innovative technologies and tools that can be integrated into teaching practices.
4. Discuss current trends and best practices in additive manufacturing.

#### **Key Topics Covered:**

- ✓ Introduction to CRDI Engine
- ✓ Engine parameters
- ✓ Performance characteristics of diesel fuelled engine
- ✓ Engine Exhaust Parameters
- ✓ Loading and Braking
- ✓ Analysis of heat power
- ✓ Analysis on heat balance curve
- ✓ Bio fuel impacts on Economic and Environmental aspects
- ✓ Challenges and Future Directions
- ✓ Conclusion

#### **Participant Engagement:**

- Faculty members from EGSPEC and Other Colleges



## Memorandum of Understanding (MoU)

Micromatic Technologies in Bangalore signed a Memorandum of Understanding (MoU) in August 2022. The purpose of this MoU is to support the use of advanced equipment and to conduct training programs. These programs aim to enhance skills and knowledge related to advanced technological equipment, likely targeting areas such as manufacturing, engineering, and other technical fields. This initiative is expected to provide participants with practical experience and improve their proficiency with cutting-edge tools and machinery, thereby contributing to workforce development and technological advancement in the region.



## VALUE ADDED COURSE

A value-added course titled "**Hands-on Training in SolidWorks (Design)**" was conducted by Pumo Technovation India Private Limited in Coimbatore from December 5th, 2022, to December 15th, 2022. The course was convened by Dr. A. Arunkumar, M.E., Ph.D., Assistant Professor of Mechanical Engineering, and coordinated by Dr. G. Sundaravadivel, M.E., Ph.D., Assistant Professor of Mechanical Engineering.

The course commenced with an introduction to Computer-Aided Design and Drafting (CADD) on the morning of December 5th, followed by an overview of the sketcher environment in the afternoon. The following day, participants practiced sketching in the forenoon and were introduced to the part modeling environment in the afternoon.

On December 7th, the practice session for part modeling continued in the forenoon, and advanced part modeling techniques were introduced in the afternoon. The course proceeded with part modeling practice on the morning of December 8th and an introduction to the assembly environment in the afternoon. December 9th included practice in the assembly environment in the forenoon and an introduction to the sheet metal environment in the afternoon.

Participants practiced sheet metal design on the morning of December 10th and were introduced to the drafting environment in the afternoon. On December 12th, the forenoon session covered drafting environment techniques and template customization, while the afternoon was dedicated to drafting practice.

On December 13th, the forenoon session focused on surface modeling, followed by practice in the afternoon. December 14th introduced reverse engineering in the forenoon and planning applications in the afternoon. The course concluded on December 15th with project work, where participants applied the concepts learned in a hands-on project, with the forenoon dedicated to the initial project phase and the afternoon to the final phase and presentations.

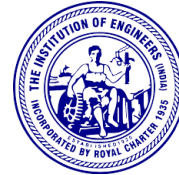
This comprehensive training program provided participants with in-depth knowledge and practical skills in SolidWorks, covering essential aspects such as sketching, part modeling, assembly, sheet metal design, drafting, surface modeling, and reverse engineering, ensuring they are well-equipped to create, modify, and analyze 3D designs effectively.





# MECHBEEZ-22

Student chapter



## Editorial Faculty Members

Dr. G. Gurumoorthy, Professor/HEAD  
Dr. S.Krishnamohan, Professor  
Dr. N.Ramanujam, Professor  
Dr. M.Kathiresan, Professor  
Dr. V.Sivaraman, Professor  
Dr. V.Sivaramakrishnan, Professor  
Dr. J.Jeevamalar, Associate Professor

## Editorial Student Members

Mr.E.Vengadesh MECH-IV  
Mr.S.Siddarthan, MECH-IV  
Mr.C.Venkatesh III-MECH  
Mr.A.Deena III-MECH  
Mrs.S.Bavadharini III-MECH  
Mr.S.Vasantha kumar III-MECH

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