
Department of
MECHANICAL ENGINEERING



SPARK

NEWSLETTER



Learn Beyond

KPR Institute of
Engineering and
Technology

(Autonomous, NAAC "A")

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About SPARK · Issue 2

SPARK is the quarterly newsletter of the Department of Mechanical Engineering, KPRIET. This issue covers October – December 2025.



CONTENTS



Issue 2 · October – December 2025

Events, research and achievements of the
Department of Mechanical Engineering

2

Editorial Board

4

KPR Institute of Engineering and Technology

5

Department of Mechanical Engineering

Vision and mission of the department

6

Events Organized

Workshops, expert talks, courses and
competitions

11

Faculty Publications

Journal articles, book chapters and
patents

12

Student Achievements

Prizes, medals and trophies won by our students





KPR INSTITUTE OF ENGINEERING AND TECHNOLOGY

KPRIET, established in 2009, is recognized for its high standards in engineering and technology. Supported by 250+ dedicated faculty and advanced facilities, KPRIET offers comprehensive programs across undergraduate, postgraduate, and research levels. Its commitment to global standards is evident in its NBA accreditation and partnerships with international institutions.

KPRIET is a dynamic environment for cultivating skilled professionals equipped for modern challenges.

VISION & MISSION

Vision:

To become a premier institute of academic excellence by imparting technical, intellectual and professional skills to students for meeting the diverse needs of industry, society, the nation and the world at large

Mission:

- Commitment to offer value-based education and enhancement of practical skills. Continuous
- assessment of teaching and learning processes through scholarly activities. Enriching research
- and innovation activities in collaboration with industry and institutes of repute.
- Ensuring the academic processes to uphold culture, ethics and social responsibilities.



DEPARTMENT OF MECHANICAL ENGINEERING

The Department of Mechanical Engineering, established in 2009, is committed to advancing technical education through a robust curriculum and research-driven approach. With over 400 students, the department offers undergraduate, postgraduate, and Ph.D. programs. Supported by 30 faculty members, 80% with Ph.D. degrees, and NBA accreditation since 2023, it provides students with essential industry skills and global perspectives.



Vision

To be recognized as a premier centre in the field of mechanical engineering education, research and development to meet the changing needs of industry and society.

Mission



Provide fundamental and skill-based education in mechanical engineering through innovative practices in teaching and learning



Establish centres of excellence in collaboration with reputed industries, professional bodies and research laboratories



Promote entrepreneurship with leadership qualities, ethics, and human values for the society at large



Events Organized

10 programmes organized by the Department during October – December 2025

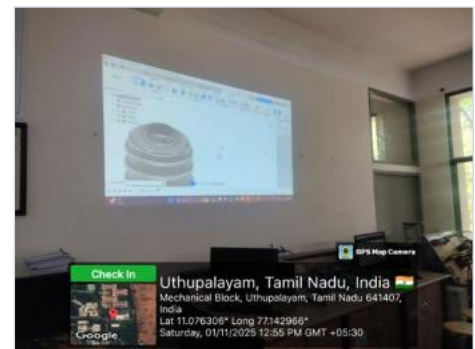
Animate Your Ideas: Motion Study and Animation with Fusion

01 November 2025 | Workshop · KPR Knowledge Campus · Resource Person & Coordinator: Dr. M. Makeshkumar, Associate Professor, Mechanical Engineering



Event Brochure

Forty-five students and three faculty members from various institutions joined a one-day workshop on motion study and animation using Autodesk Fusion. Dr. M. Makeshkumar demonstrated how to build assemblies, define joints and motion links, and generate realistic animations that bring a mechanism to life. Through hands-on exercises, participants converted conceptual ideas into motion simulations and used them to check interference and functional behaviour before any physical prototype was built. The workshop sharpened participants' CAD and visualisation skills and encouraged creative, virtual-first product design.



Design and Optimization of HVAC Systems for Industrial Applications

05 November 2025 | Workshop · Thanam Hall · Resource Person: Mr. D. Balaji, Partner, SRB & Associates – HVAC Consultants · Convenor: Dr. N. Udhayakumar



Event Brochure

An overwhelming 164 students from engineering colleges across the region attended this workshop on industrial HVAC design. Following the welcome address by Dr. N. Udhayakumar and presidential address by Dr. S. Ramesh Babu, HoD, Mr. D. Balaji of SRB & Associates shared practical insights on HVAC design principles, component selection, energy management and optimisation for industrial environments. Real-world case studies and lively Q&A sessions linked classroom thermodynamics to green-building standards and sustainable practice. The workshop gave participants a clear view of career opportunities in the fast-growing HVAC and building-services sector.



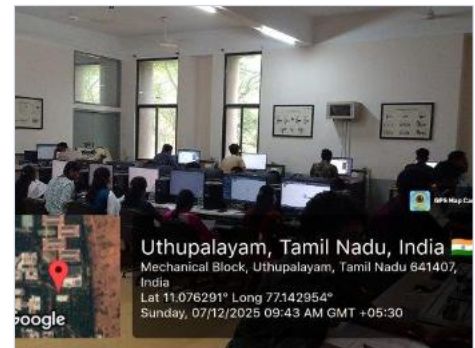
TN Skills Competition – Additive Manufacturing (Level 2)

07 December 2025 | Competition · Centre for 3D Printing, Mechatronics Lab · Jury: Mr. Sriman Narayanaraju, WorldSkills Trainer, Solidstone Groups · Competition Manager: Mr. P. Arunkumar



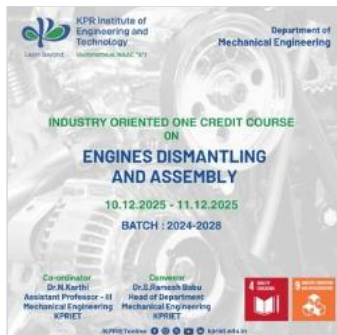
Event Brochure

The Centre for 3D Printing hosted the Level 2 round of the Tamil Nadu Skills Competition in Additive Manufacturing, conducted under the Tamil Nadu Skill Development Corporation. Twenty-eight diploma and UG students competed in CAD modelling to given dimensions and slicing-parameter optimisation, and were judged on modelling accuracy, print quality and dimensional tolerance. The jury, led by WorldSkills trainer Mr. Sriman Narayanaraju, shortlisted top performers for the next level of the state competition. Hosting the event showcased the department's additive manufacturing facility and its commitment to nurturing skills of state and national standard.



One Credit Course: Engine Dismantling and Assembly

10 – 11 December 2025 | One Credit Course · Ambal Private Industrial Training Institute · Convenor: Dr. S. Ramesh Babu · Co-convenor: Dr. N. Karthi



Event Brochure

Forty students rolled up their sleeves at Ambal Private Industrial Training Institute for an industry-oriented course on engine dismantling and assembly. Under expert supervision, they systematically dismantled internal combustion engines, identified each component and its function, and measured parts for wear and clearance using precision instruments. Reassembly followed the manufacturer's sequence, torque specifications and alignment procedures. Students also learned to diagnose likely failure modes and document inspection and safety checklists to industrial maintenance standards – an experience that turned textbook diagrams into real, working engines.



One Credit Course: New Product Design and Development

10 – 11 December 2025 | One Credit Course · KPR Knowledge Campus · Resource Person: Mr. Dinoj Joseph, Co-Founder & MD, Medgyor Pvt. Ltd. · Coordinator: Dr. M. Makesh Kumar



Event Brochure

Third-year students explored how successful products are born in a two-day course led by Mr. Dinoj Joseph, Co-Founder of Medgyor Pvt. Ltd. Day one focused on customer-centric thinking, human-centred design and structured ideation, with teams mapping a real industry problem and selecting a concept. Day two moved to lean, low-fidelity prototyping and assumption testing – asking “should we build this?” before “can we build this?” – and closed with a Business Model Canvas exercise and a final pitch to a panel of judges. Students came away with a practical toolkit for turning ideas into market-ready products.



One Credit Course: U21OME19 – Industrial Robot Tooling and Actuation

10 – 11 December 2025 | One Credit Course · Axis Global Automation, Coimbatore · Coordinator: Dr. S. N. Dinesh



Event Brochure

Thirty-five second-year students completed a two-day industry-oriented course on Industrial Robot Tooling and Actuation at Axis Global Automation, Coimbatore. Industry experts introduced the fundamentals of industrial robots, end-effector and gripper design, actuation systems and their integration into automated manufacturing cells. Live demonstrations of robotic arms and tooling set-ups helped students understand programming basics, design considerations for tooling, and safety in industrial environments. The course bridged classroom theory with factory practice and sparked strong interest in careers in automation and robotics.



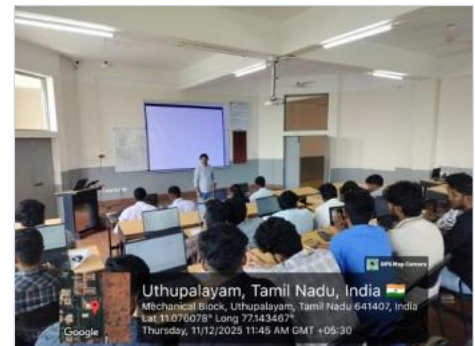
One Credit Course: PLC-Based Smart Factory Automation

10 – 11 December 2025 | One Credit Course · Mechatronics Lab · Resource Persons: Mr. R. Sasikumar, Managing Director, and Mr. Santhosh, Senior Engineer, SARA Control and Automation · Coordinator: Mr. P. Arunkumar



Event Brochure

Thirty-nine third-year students learned to program the brains of the modern factory in this industry-oriented course delivered by SARA Control and Automation, Coimbatore. Starting with PLC architecture and ladder logic, students progressed to timers, counters and sensor-actuator interfacing, and built control sequences for typical smart-factory tasks on trainer kits in the Mechatronics Lab. The sessions highlighted how PLCs tie together machines, conveyors and quality checks in Industry 4.0 environments. Participants gained hands-on automation skills that are increasingly sought after by core manufacturing employers.



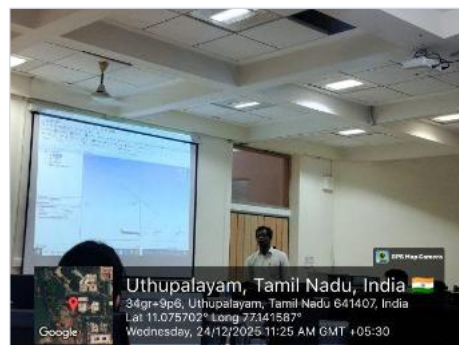
Value Added Course: Practical Computational Fluid Dynamics

22 – 24 December 2025 | VAC / Training Programme · LIS Lab · Resource Person: Mr. R. Bharathwaaj, Head – R&D, E Qubz Battery Technology, Coimbatore · Coordinator: Dr. M. Makeshkumar



Event Brochure

This three-day value added course gave students a structured, hands-on route into industrial CFD. Day one covered the role of CFD in aerospace, automotive and energy sectors, followed by geometry creation and mesh generation with attention to grid convergence. Day two introduced solver theory, turbulence models and RANS simulation set-up, with students running and monitoring their first cases. On day three, participants post-processed results, validated them against experimental data and presented mini-projects on airfoil and pipe-bend flows. Students finished with practical simulation skills and certificates of completion.



Value Added Course: U21VME13 – Plant Layout using Tecnomatix

22 December 2025 | VAC / Training Programme · KPR Knowledge Campus · Coordinator: Dr. S. N. Dinesh

Third-year students were introduced to digital factory planning through a value added course on Siemens Tecnomatix. Participants learned to create and modify plant layouts, position machines, workstations and conveyors efficiently, and analyse material flow and space utilisation. Using simulation, they studied production flow, throughput and resource utilisation, and compared alternative layouts before committing to a design. The course gave students practical exposure to the digital manufacturing tools used by industry to model, analyse and optimise production systems.



Value Added Course: SolidWorks

10 December 2025 | VAC / Training Programme · Mechatronics Lab · Coordinators: Dr. N. Mathan Kumar and Dr. N. Karthi

Forty students strengthened their core design skills in a value added course on SolidWorks. Over a series of hands-on sessions they built 3D part models using extrude, revolve, sweep and loft features, created assemblies with appropriate mates and motion relationships, and produced fully dimensioned engineering drawings with standard views, annotations and basic tolerances. The course concluded with an introduction to simulation, where students evaluated simple stress and motion behaviour of their designs – boosting their readiness for design roles in core industries.

Faculty Publications

9 journal articles, 1 book chapter and 1 patent

Journal Publications

1. Silambarasan, B., Gayathiri, N.R., Thirumaraiselvi, C., Mahendra Boopathi, M., Hariprasad, P. and Gokulkumar, S. (2025) 'The convergence of AI and composites – a review anchored in patent trends', *Journal of Polymer & Composites*, 13(6). Available at: <https://doi.org/10.37591/JOPC.v13i06.232799>.
2. Aravindh, M., Barik, D., Sarbast, F.R., Makeshkumar, M., Selvam, D.M., Seepana, P. and Saravanan, R. (2025) 'Optimization of tribo-mechanical properties of kenaf/jute-SiC hybrid composites using integrated grey-fuzzy approach', *Scientific Reports*, 15. Available at: <https://doi.org/10.1038/s41598-025-20268-3>.
3. Muthukumar, N., Arulmurugan, B. and Manikandan, M. (2025) 'Investigation of microstructure, residual stresses, and mechanical behavior of Inconel 59 and AISI 904L fusion joint using single pulse GMAW with post-weld cryogenic treatment', *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*. Available at: <https://doi.org/10.1177/09544054251383802>.
4. Gayathri, V., Gowtham, M. and Gokulkumar, S. (2025) 'Synthesis and dual functional assessment of POT/ZnO composite for photocatalytic and energy storage applications', *Journal of the Indian Chemical Society*, 102224. Available at: <https://doi.org/10.1016/j.jics.2025.102224>.
5. Nataraj, G., Ramesh Babu, S. and Senthil Kumar, A.P. (2025) 'Enhancing mechanical and morphological properties of PLA composites reinforced with Curcuma longa extraction residue via fused deposition modelling', *Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science*. Available at: <https://doi.org/10.1177/09544062251381476>.
6. Venkatasudhahar, M., Muthukumar, S., Mathan Kumar, N., Manojkumar, P., Al Awadh, M. and Rajendran, P. (2025) 'Experimental study of lubricating wear phenomena in Ag-Mg alloy systems', *Scientific Reports*. Available at: <https://doi.org/10.2139/ssrn.491022>.
7. Manoj Mohan Prasath, V., Dharani Kumar, S. and Kumar, S.S. (2025) 'Improvement in ballistic properties of heat affected zone in AA5754 friction stir welded joints', *Journal of Adhesion Science and Technology*. Available at: <https://doi.org/10.1080/01694243.2025.2584483>.
8. Dharani Kumar, S., Rusinek, A. and Jankowiak, T. (2025) 'Extension of the Rusinek–Klepaczko model for materials with saturated or moderate strain hardening: application to 2024 aluminum alloy', *Journal of Dynamic Behavior of Materials*. Available at: <https://doi.org/10.1007/s40870-025-00503-8>.
9. Sitharaj, A., Balasubramanian, A. and Sivanraju, R. (2025) 'Artificial intelligence in wire arc additive manufacturing: a systematic review and patent landscape analysis', *Engineering Reports*. Available at: <https://doi.org/10.1002/eng2.70518>.

Book Chapters

1. Sitharaj, A., Arulmurugan, B., Idhayaraja, S. and Gokulkumar, S. (2025) 'Biomimetic 4D printing: state-of-the-art and perspectives', in *Biomimetic and Bioinspired Materials*. Boca Raton, FL: CRC Press.

Patents

1. Makeshkumar, M. (2025) *Height adjustable pallet mover with screw jack*. Indian Patent Application No. 202541124004 A, filed 19 December 2025, published 13 February 2026. KPR Institute of Engineering and Technology.

Student Achievements

Our students bring home prizes, medals and trophies



Gowrisankar P (Team Uvira)

Secured 1st place in Robo Soccer and 2nd place in Amphibot, RC Rally Cross and Battle of Bots @ Conscientia 2025, Indian Institute of Space Science and Technology, Thiruvananthapuram



Akash G (Team Uvira)

Secured 2nd place in Robo Soccer and 3rd place in Amphibot, RC Rally Cross, Battle of Bots and Tech Glide @ Conscientia 2025, Indian Institute of Space Science and Technology, Thiruvananthapuram



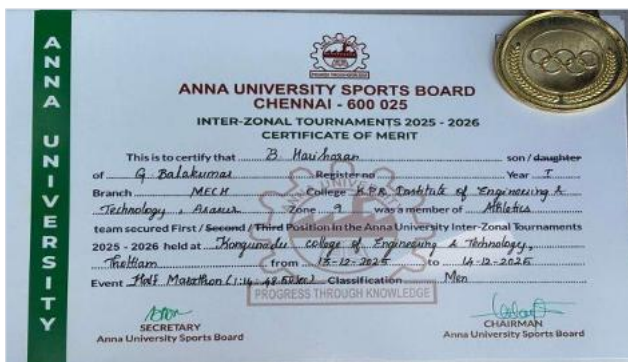
Mano Sachin Samanayan M

Secured 2nd place in "3D Design – Visualizing the Dream" @ IEEE Day 2025 (IEEE EMBS & IMS), KPRIET, Coimbatore



Maro S G & KPRIET Football (Men) Team

Secured 2nd place in Anna University Inter-Zonal Football Tournament 2025–26 @ Adhiyamaan College of Engineering, Hosur



Hariharan B

Secured 1st place in Half Marathon @ Anna University Inter-Zonal Athletics 2025–26, Kongunadu College of Engineering and Technology, Thottiam



Hariharan B

Secured 2nd place in 10,000 m @ Anna University Inter-Zonal Athletics 2025–26, Kongunadu College of Engineering and Technology, Thottiam

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