



Name of the Department: Mechanical Engineering

Name of Research and Education center:

Research & Education Center **Design, Analysis and Simulation**

About the Center:

The Design, Analysis, and Simulation Lab in Mechanical Engineering serves as a critical research facility for advancing design methodologies, conducting in-depth analysis, and simulating complex mechanical systems. It facilitates exploration of innovative design concepts, leveraging advanced software tools for modeling and simulation to optimize performance parameters such as structural integrity, thermal behavior, and fluid dynamics. Through interdisciplinary collaboration, the lab addresses real-world engineering challenges spanning fields like renewable energy, automotive engineering, and aerospace technologies. Its research endeavors not only enhance understanding of mechanical phenomena but also drive innovation, fostering the development of cutting-edge solutions to meet evolving societal and industrial needs. Moreover, the lab provides valuable educational resources and training opportunities, nurturing the next generation of mechanical engineers equipped with advanced design and analysis skills.

The primary functions of the center:

1. **Concept Development:** Generating innovative design concepts through computational modeling and simulation to address engineering challenges.
2. **Performance Evaluation:** Analyzing the performance of mechanical systems and components using advanced simulation techniques, such as finite element analysis (FEA) and computational fluid dynamics (CFD).
3. **Optimization:** Conducting optimization studies to enhance the efficiency, reliability, and functionality of mechanical designs through iterative analysis and refinement.
4. **Interdisciplinary Collaboration:** Collaborating with other engineering disciplines to tackle multidisciplinary problems and explore synergies between different areas of research.
5. **Technology Development:** Developing and validating new simulation tools and methodologies to push the boundaries of mechanical engineering research and innovation.
6. **Education and Training:** Providing opportunities for students and researchers to gain expertise in design, analysis, and simulation techniques through hands-on projects and training initiatives.

**Major equipments: (along with description / Cost/ photographs)**

S. No.	Major equipment	Quantity	Cost of the equipment Rs. in Lakhs	Photograph
1.	DELL Desktop-- Intel core I5- 8500/8GB 1TB HDD/Key board, optical mouse 19.5" LED Monitor, 2GB Graphics Card	74	33.004	
2.	DELL T30 SERVER-- INTEL XION Processor, 16 GB RAM/2 TB HDD Key board/Mouse 18.5" LED Monitor	02	1.36	
3.	DELTA EH -20KVA 3P/1P UPS	01	2.65	

Major software list with description:

S. No.	Major Software	No. of Users	Cost of the Software Rs. in Lakhs
1.	ANSYS 2019R3	75	12.095
2.	MATLAB	74	0.68114 (Shared amount)


Types of projects / research carried out with description:

Sl. No.	Academic Year	Project Guide	Title of the Project
1.	2018-19	Sri CH. Karunakar	Design and analysis of four-legged robot using strandbeest mechanism
2.		Dr. G. Ganesh Kumar	Design, manufacturing and simulation of a centrifugal pump for artificial heart
3.		Sri K. Kishor Kumar	Finite Element Analysis of basalt and abelmoschus esculentus fiber reinforced hybrid polymer matrix composite and optimization of design parameters using anova technique.
4.		Sri A. Hari Kumar	Fem analysis of single flute clutch using e-glass epoxy and aluminum metal matrix
5.	2019-20	Sri. Abhay Lingayat/V.Vinod Kumar	Experimental and numerical investigations of heat transfer behavior of air flow in solar air collector and performance
6.		Dr. G. Srinivasa Rao	Modelling and analysis of helical gear
7.		Dr. G. Srinivasa Rao	Numerical Analysis and Simulation of Composite Spur Gear
8.		Sri A. Hari Kumar	Failure and Non-Linear Analysis of the piston of a diesel engine.
9.		Dr. K. Sridhar	Numerical Simulation of the micro combustion chamber
10.	2020-21	Dr. J. laxman	Static analysis of aerofoil
11.		Dr. K. Eswaraiiah	Static & thermal analysis of a gas turbine disc
12.		Dr. E. Ramesh	Comparison of different turbulence models for turbulent flow in ducts
13.		Sri V. Rakesh	Design And Static Structural Analysis On Different Types of Shell Structures
14.		Sri CH. Karunakar	Design and Analysis of Single Plate Clutch
15.		Sri A. Hari Kumar	Design and Dynamic analysis of Leaf Spring
16.		Sri K. Kishor Kumar	Design and Analysis of GO KART Chassis
17.		Sri S. Sripathy	Design and Analysis of Automobile Wheel
18.		Sri V. Srikanth	CFD Analysis of Exhaust Manifold of Multi-Cylinder Petrol Engine
19.		Sri V. Rakesh	Design and Performance Analysis of Centrifugal Pump Impeller
20.		Sri V. Rakesh	Design and Thermo-structural analysis on different types of shell structures
21.	Ms. G. Sumithra	Stress Analysis on Spur Gear using ANSYS	
22.	2021-22	Sri P. Anil Kumar	Modelling and Structural Analysis of a Heavy Vehicle Chassis for Different Alloy Materials at Different Optimum Loads
23.		Sri S. Sripathy	Design and Analysis of automobile wheel
24.		Sri M. Anil Kumar	Design & analysis of an automotive radiator for an enhanced liquid cooling system
25.		Sri CH. Karunakar	Static structural analysis using iso geometric analysis and comparative study with finite element analysis
26.	2022-23	Sri CH. Karunakar	Heat transfer analysis of shell and tube heat exchanger



KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE

Opp : Yerragattu Gutta, Hasanparthy (Mandal), WARANGAL - 506015, TELANGANA, INDIA

కాకతీయ ప్రాధ్యోగికీ एवं विज्ञान संस्थान, వరంగల్ - ౫౦౬౦౧౫, తెలంగాణ, భారత

కాకతీయ సాంకేతిక విజ్ఞాన శాస్త్ర విద్యాలయం, వరంగల్ - ౫౦౬ ౦౧౫ తెలంగాణ, భారతదేశము

(An Autonomous Institute under Kakatiya University, Warangal)

(Approved by AICTE, New Delhi; Recognised by UGC under 2(f) & 12(B); Sponsored by EKASILA EDUCATION SOCIETY)

website: www.kitsw.ac.in

E-mail: principal@kitsw.ac.in

☎ : +91 9392055211, +91 7382564888

Sl. No.	Academic Year	Project Guide	Title of the Project	
27.		Sri S. Anil Kumar	Finite Element Method of connecting rod using different materials	
28.		Sri M. Anil Kumar	CFD simulation and heat transfer analysis of a radiator with nano fluids and carbon foam	
29.		Smt. P. Anitha	Structural and thermal analysis of ic engine piston made of three materials using Ansys	
30.		Ms. P. Divya	Design and Analysis of thermal distribution in Fins of compressor	
31.		Sri V. Rakesh	Comparative study of isogeometric analysis with finite elements Analysis	
32.		Dr. E. Ramesh	Analysis of an SAE BAJA Roll Cage	
33.		Dr. J. Laxman	CFD analysis at varied liquid flows through orifice meter and venturi meter	
34.		Sri A. Hari Kumar	Design and analysis of front and rear wing for a formula student car	
35.		Sri K. Kishor Kumar	Design and analysis of composite monocoque chassis for formula student car	
36.		Dr. T. Manoj Kumar	CFD Analysis of External Flow Vortex Shedding for flow over a Ribbed and Grooved Cylinder	
37.		Sri P. Anil Kumar	FEA and structural analysis on Aircraft wing by using ANSYS and CFD	
38.		Sri S. Anil Kumar	CFD based performance analysis of solar air heater	
39.		2023-24	Dr. G. Srinivasa Rao & Dr. B. Srinivasa Reddy	Performance evaluation of air breathing Proton Exchange Membrane fuel cell using CFD analysis
40.			Dr. G. Ganesh Kumar & Dr. T. Manoj Kumar	Numerical and Experimental analysis of vertical axis wind turbine blades for different angles of attack using ANSYS Fluent
41.		Dr. G. Srinivasa Rao	Numerical and experimental free convection heat transfer analysis of sphere embedded in porous medium	
42.	2024-25	Sri S. Anil Kumar	CFD analysis of proton exchange member fuel cell at different operating parameters	
43.		Sri S. Ramesh	Thermal Analysis of Heat Sink with Fins of different Configuration	

Details of Faculty incharge for Research and Education Center: (Photo, Contact details)



Sri. K. Kishor Kumar
 Assistant Professor of ME
 Mobil: 9440431548
 Email: kkk.me@kitsw.ac.in