KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE
(An Autonomous Institute under Kakatiya University, Warangal)
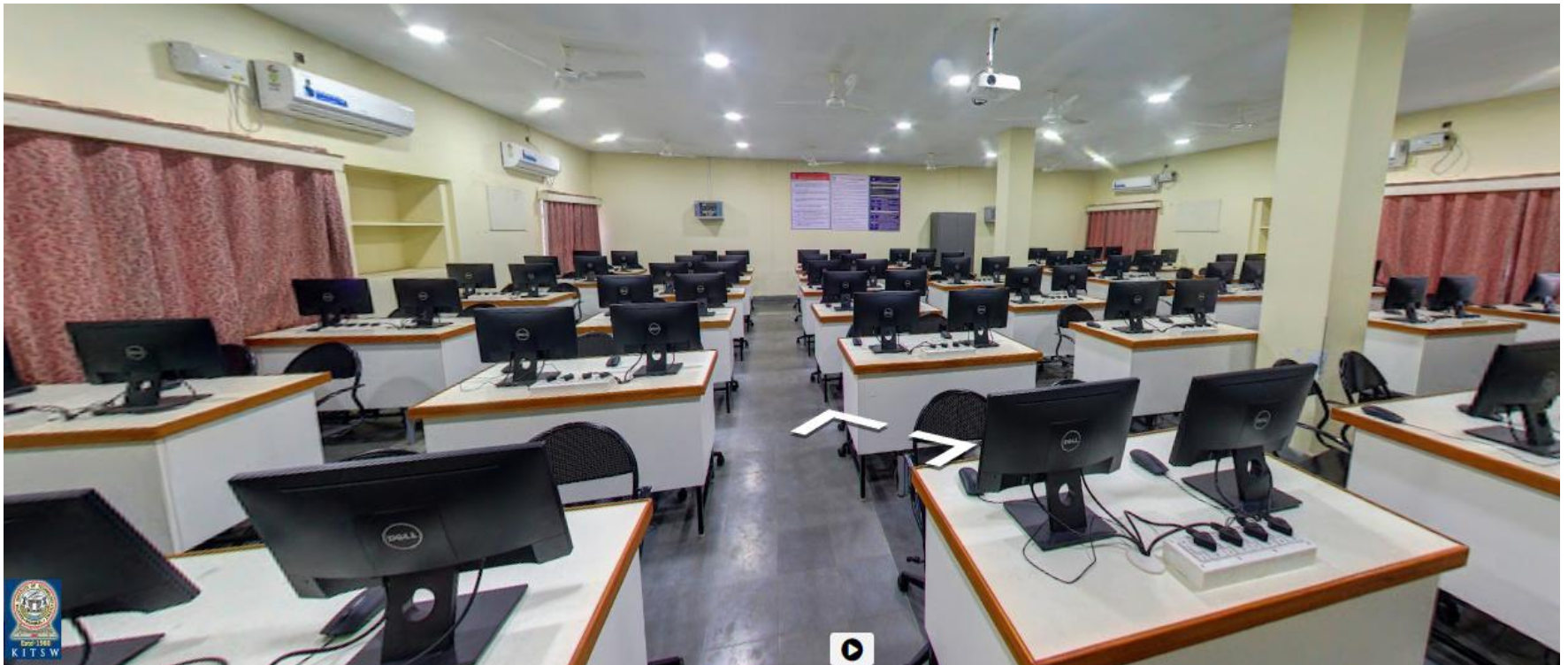
Opp : Yerragattugutta, Bheemaram (V), Hasanparthy (Mandal), WARANGAL - 506 015, Telangana State, INDIA.

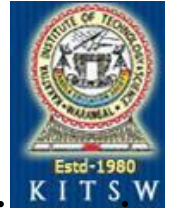काकतीय प्रौद्योगिकी एवं विज्ञान संस्थान, बरंगल - ५०६ ०१५ तेलंगाना राज्य, भारत

కాకతీయ సాంకేతిక విజ్ఞాన శాస్త్ర విద్యాలయం, వరంగల్ - 506 015. తెలంగాణ రాష్ట్రం, భారతదేశము

DEPARTMENT OF MECHANICAL ENGINEERING

Estd-1980
K I T S W

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.
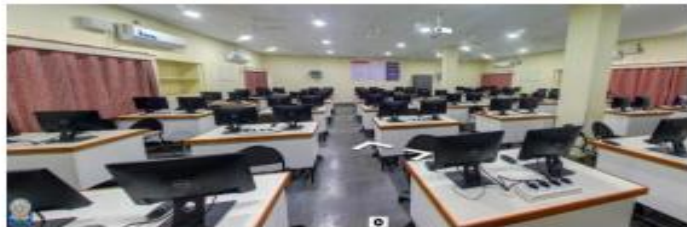
The primary functions of the center:

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

Major equipments:

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
1.	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		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	2018-19	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

Types of projects / research carried out with description:

1.	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
2		Dr. G. Srinivasa Rao	Modelling and analysis of helical gear
3		Dr. G. Srinivasa Rao	Numerical Analysis and Simulation of Composite Spur Gear
4		Sri A. Hari Kumar	Failure and Non-Linear Analysis of the piston of a diesel engine.
5		Dr. K. Sridhar	Numerical Simulation of the micro combustion chamber

Types of projects / research carried out with description:

No.	Year	Name	Description
1.	2020-21	Dr. J. laxman	Static analysis of aerofoil
1.		Dr. K. Eswaraiah	Static & thermal analysis of a gas turbine disc
1.		Dr. E. Ramesh	Comparison of different turbulence models for turbulent flow in ducts
1.		Sri V. Rakesh	Design And Static Structural Analysis On Different Types of Shell Structures
1.		Sri CH. Karunakar	Design and Analysis of Single Plate Clutch
1.		Sri A. Hari Kumar	Design and Dynamic analysis of Leaf Spring
1.		Sri K. Kishor Kumar	Design and Analysis of GO KART Chassis
1.		Sri S. Sripathy	Design and Analysis of Automobile Wheel
1.		Sri V. Srikanth	CFD Analysis of Exhaust Manifold of Multi-Cylinder Petrol Engine
1.		Sri V. Rakesh	Design and Performance Analysis of Centrifugal Pump Impeller
1.		Sri V. Rakesh	Design and Thermo-structural analysis on different types of shell structures
1.		Ms. G. Sumithra	Stress Analysis on Spur Gear using ANSYS

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## Types of projects / research carried out with description:

1		Sri P. Anil Kumar	**Modelling and Structural Analysis of a Heavy Vehicle Chassis for Different Alloy Materials at Different Optimum Loads**
2		Sri S. Sripathy	Design and Analysis of automobile wheel
3	2021-22	Sri M. Anil Kumar	Design & analysis of an automotive radiator for an enhanced liquid cooling system
4		Sri CH. Karunakar	Static structural analysis using iso geometric analysis and comparative study with finite element analysis

Types of projects / research carried out with description:
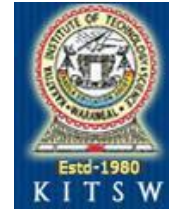
1		Sri CH. Karunakar	Heat transfer analysis of shell and tube heat exchanger
2		Sri S. Anil Kumar	Finite Element Method of connecting rod using different materials
3		Sri M. Anil Kumar	CFD simulation and heat transfer analysis of a radiator with nano fluids and carbon foam
4		Smt. P. Anitha	Structural and thermal analysis of ic engine piston made of three materials using Ansys
5		Ms. P. Divya	Design and Analysis of thermal distribution in Fins of compressor
6		Sri V. Rakesh	Comparative study of isogeometric analysis with finite elements Analysis
7	2022-23	Dr. E. Ramesh	Analysis of an SAE BAJA Roll Cage
8		Dr. J. Laxman	CFD analysis at varied liquid flows through orifice meter and venturi meter
9		Sri A. Hari Kumar	Design and analysis of front and rear wing for a formula student car
10		Sri K. Kishor Kumar	Design and analysis of composite monocoque chassis for formula student car
11		Dr. T. Manoj Kumar	CFD Analysis of External Flow Vortex Shedding for flow over a Ribbed and Grooved Cylinder
12		Sri P. Anil Kumar	FEA and structural analysis on Aircraft wing by using ANSYS and CFD
13		Sri S. Anil Kumar	CFD based performance analysis of solar air heater

Types of projects / research carried out with description:

1	2023-24	Dr. K.Sridhar	A hybrid combining heat pipe with phase change material-based battery thermal management system
2		Dr. G. Srinivasa Rao	Performance evaluation of air breathing Proton Exchange Membrane fuel cell using CFD analysis
3		Dr. G. Ganesh Kumar	Numerical and Experimental analysis of vertical axis wind turbine blades for different angles of attack using ANSYS Fluent
4		Sri A.Hari Kumar	Numerical Analysis of Metal foams: Prediction of static behavior
5		Sri S. Ramesh	Thermal Management of electronics

Thank you!!!!!