



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

## DEPARTMENT OF MECHANICAL ENGINEERING

**Name of the Research Group:** Thermal Science

**Head of the Group:** Dr. P. Vijay Kumar, Professor

The success of any organization depends greatly on the group work or collaborative work. The innovative ideas from a small group of people eventually will be transformed in to a reality in the form of a quality research work or a project work or a patent or working/prototype model. The group members can contribute their wisdom in research group interactions and periodical meetings. Also the collaborative working environment not only bring out the inherent potential, skills and expertise of the faculty members but also provide an opportunity to develop leadership qualities, team work, sharing of ideas and knowledge. This will improve the interest and confidence levels of the faculty members, when they have inclination towards R&D activities. With this motto, the Department of Mechanical Engineering created Thermal sciences group which will function with the following aims.

### **Aim:**

Thermal science group aims at developing innovative, energy efficient, environment friendly thermal and renewable systems on thermo-economic perspective for the needs of domestic, industrial and commercial domains.

### **Objectives:**

- ❖ To identify the burning topics and key areas of research in thermal sciences and work seriously in that direction.
- ❖ To develop a system/experiments beyond the curriculum.
- ❖ To have the updated information regarding project proposals from different funding agencies(DST, UGC, AICTE, MNRE, ISRO,DRDO etc..) and motivate the faculty to prepare and submit quality project proposals for the above funding agencies.
- ❖ To have collaborative work among the members and produce quality paper publications with mutual sharing of skills and expertise.
- ❖ To motivate the young faculty towards developing interest in R&D activities and guide them register for Ph.D programmes under IIT/NIT/IIIT/JNTUK/AU.

### Thermal Science group key areas of research

- IC engines & Alternate fuels
- Heat transfer applications
- Phase change materials
- Solar systems
- Biomass Utilization

### Thermal Science Research Group members:

S.No	Faculty members	Qualification	Email ID	Designation
1	Dr.K.Appa Rao	M.Tech, Ph.D	apparaokandimalla@gmail.com	Professor
2	Dr.P.Vijaya Kumar	M.Tech, Ph.D	pjoel2013@gmail.com	Professor
3	Dr.P.Ravindra Kumar	M.Tech, Ph.D	pasupuletirk@gmail.com	Professor
4	Dr.K.Dilip Kumar	M.Tech, Ph.D	dilip_011@yahoo.co.in	Professor
5	Dr.V.Dhana Raju	M.Tech, Ph.D	dhanaraju1984@gmail.com	Assoc. Professor
6	Dr.N.Sunil Naik	M.Tech, Ph.D	sunilnaik.n@gmail.com	Assoc. Professor
7	A.Naresh Kumar	M.Tech, (Ph.D)	nareshkumarakula@hotmail.com	Sr. Asst. Professor
8	S.Rami Reddy	M.Tech, (Ph.D)	ramireddy.mec@gmail.com	Asst. Professor
9	K.Lakshmi Prasad	M.Tech	klprasad1108@gmail.com	Asst. Professor
10	D.Mallikarjuna Rao	M.Tech, (Ph.D)	malliaug01@gmail.com	Asst. Professor
11	B.Kamala Priya	M.Tech, (Ph.D)	kamala.jkp@gmail.com	Asst. Professor
12	K.Saibabu	M.Tech	kolahalamsaibabu332@gmail.com	Asst. Professor
13	K.Srinivasa Rao	M.Tech	srinukarnati123@gmail.com	Asst. Professor
14	S.Uma Maheswara Reddy	M.Tech	umr341@gmail.com	Asst. Professor

### Research facilities available in the Department

- PC based Four stroke diesel engine test rig
- Four stroke variable compression ratio engine test rig
- Exhaust gas analyser, Smoke meter
- Fuel testing facility
- Thermal conductivity of liquids
- Solar concentrating parabolic collector
- CRDI Diesel Engine and AVL five gas analyser

**Thermal Science research Group members acted as reviewers for following Journals:**

S.No	Name of journal	Reviewed (Nos)
1	International Journal of Ambient Energy	10
2	Biofuels	4
3	Environmental Progress and Sustainable Research	2
4	Fuel	4
5	Environmental progress & sustainable Energy	2
6	Journal of Thermal Engineering, Yildiz University	2
7	Current journal of applied science and Technology	2
8	International Journal of Green Energy	2
9	Alexandria Engineering Journal	1
10	Biomass Conversion and Biorefinery	2

**Thermal Science Group members guiding research scholars for Ph.D**

S.No	Faculty members	Designation	Under university
1	Dr.K.Appa Rao	Professor	JNTUK- Kakinada
2	Dr.P.Vijay Kumar	Professor	JNTUK- Kakinada
3	Dr.P.Ravindra Kumar	Professor	JNTUK- Kakinada
4	Dr.K.Dilip Kumar	Professor	JNTUK- Kakinada, KLEF-Vaddeswaram
5	Dr.V.Dhana Raju	Assoc. Professor	JNTUK- Kakinada, KLEF-Vaddeswaram
6	Dr.N.Sunil Naik	Assoc. Professor	JNTUK- Kakinada

**Thermal Science research Group members Received Sponsored Project/Grants:**

S.No.	Name of project	Name of Faculty	Amount	Funding Agency	Sanctioned Year
1.	Evaluation of engine parameters affecting the performance of enzymatic transesterification process using test fuel blends	Dr.N.Sunil Naik	22,81,000	DST-SERB	2019-20
2	Experimental Investigation on Homogeneous Charge Compression Ignition (HCCI) Engine	Dr.K.Appa Rao	1,55,000	UGC	2016-17

3	Modernization and Removal of Obsolescence of Thermal Engineering Laboratory	Dr.K.Appa Rao	12,50,000	AICTE	2017-18
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### Thermal Science research Group members List of Publications:

S.No	Title of the paper	Name of the author/s	Name of journal	Year of publication	ISBN/ISSN number
1	Characterisation of zinc oxide nanoparticles–herbal synthesised coated with Ocimum tenuiflorum	M. Bala Chennaiah, K. Dilip Kumar, B. Sudheer Kumar & Srinivasa Rao Tanneeru	Advances in Materials and Processing Technologies	2020-2021	2374-068X
2	Enhancement in combustion, performance and Emission characteristics of a Diesel engine fueled with Ce-zno Nano particle additive added to soybean biodiesel blends	Fayaz Hussain, Manzoore Elahi M. Soudagar, Asif Afzal , M.A. Mujtaba, I.M. Rizwanul Fattah, Bharat Naik, Mohammed Huzaifa Mulla, Irfan Anjum Badruddin, T. M. Yunus Khan, Vallapudi Dhana Raju, Rakhamaji S. Gavhane and S.M. Ashrafur Rahman	Energies	2020-2021	1996-1073
3	Effect of Sr@ZnO nanoparticles and Ricinuscommunis biodiesel-diesel fuel blends on modified CRDI diesel engine characteristics	Manzoore Elahi M. Soudagar, M.A. Mujtaba, Mohammad Reza Safaei, Asif Afzal ,Dhana Raju V, Waqar Ahmed, N.R. Banapurmath, Nazia Hossain, Shahid Bashir,Irfan Anjum Badruddin, Marjan Goodarzi, Kiran Shahapurkar, Syed NoemanTaqui	Energy	2020-2021	0360-5443
4	An experimental assessment of prospective oxygenated additives on the diverse characteristics of diesel engine powered with waste tamarind biodiesel	V. Dhana Raju, Harish Venu, LingesanSubramani, P.S. Kishore, P.L. Prasanna, D. Vinay Kumar	Energy	2020-2021	0360-5443
5	Effect of split fuel injection strategies on the diverse characteristics of CRDI diesel engine operated with tamarind biodiesel	Katuri Bala Prasad, Oliva Meduri, Vallapudi Dhana Raju, Aruna Kumari Azmeera, Harish Venu, Lingesan Subramani and Manzoore Elahi M.Soudagar	Energy Sources, Part A: Recovery, Utilization, and Environmental Effects	2020-2021	1556-7036
6	Influence of Al <sub>2</sub> O <sub>3</sub> nano additives in ternary fuel	Harish Venu, V.Dhana Raju, S.Lingesan and	Energy	2020-2021	0360-5443

	(diesel-biodiesel-ethanol) blends operated in a single cylinder diesel engine: Performance, combustion and emission characteristics	ManooreElahi M Soudagar			
7	Effect of alcoholic and nano-particles additives on tribological properties of diesel-palm-sesame biodiesel blends	MA Majtaba, Haeng Muk Cho, HH Masjuki, MA Kalam, M.Farroq, Manzoore Elahi M.Soudagar, M Gul, Waqar Ahmed, Asif Afzal, Shahid Bashir, V.Dhanaraju, HAseeb Yaqoob and A.Z.Syahir	Energy Reports	2020-2021	2352-4847
8	Experimental assessment of performance, combustion and emission characteristics of diesel fuelled with lemon peel oil	A.Aruna Kumari, G.Sivaji, Syed Arifa, O.Sai Mahesh, T.Raja Rao, S.Venkata Kalyan, V.Dhana Raju, K.Bhargava and K.Lakshman Reddy	International Journal of Ambient Energy	2020-2021	2162-8246
9	Mitigation of harmful exhaust pollutants of DI diesel engine using emulsified fuel and hythane gas in a dual-fuel mode	Radha Krishna Gopidesi , Premkartikkumar Sr & Vallapudi Dhana Raju	Energy Sources, Part A: Recovery, Utilization, and Environmental Effects	2020-2021	1556-7036
10	Impact of Injection timings and exhaust gas recirculation rates on the characteristics of diesel engine operated with neat tamarind biodiesel	K.Bala Prasad, V.Dhana Raju, Areef Ahamad Shaik, Radha Krishna Gopidesi, M.Bala Satya Sreekara Reddy, Manzoore Elahi M Soudagar , and Muhammad Abbas Mujtaba	Energy Sources, Part A: Recovery, Utilization, and Environmental Effects	2020-2021	1556-7230
11	Decanol proportion effect prediction model as additive in palm biodiesel using ANN and RSM technique for diesel engine	A.Naresh Kumar, P.S.Kishore, K.Brahma Raju, B.Ashok, R.Vignesh, A.K.Jeevanantham, K.Nanthagopal, A.Tamilvanan	Energy	2020-2021	0360-5442
12	Experimental analysis of higher alcohol-based ternary biodiesel blends in CI engine parameters through multivariate and desirability approaches	A. Naresh Kumar, B. Ashok, K. Nanthagopal, H. C. Ong, M. J. Geca, John Victor, R. Vignesh, A. K. Jeevanantham, C. Kannan, P. S. Kishore	Biomass Conversion and Biorefinery	2020-2021	2190-6823
13	Combined influence of compression ratio and EGR on diverse characteristics of a research diesel engine	AreefAhamadShaik , Seelam Rami Reddy , VallapudiDhana Raju &MuraliGovindarajan	Energy Sources, Part A: Recovery, Utilization, and Environmental	2020-2021	1556-7036

	fueled with waste mango seed biodiesel blend		Effects		
14	Assessment of diethyl ether as a fuel additive on the diverse characteristics of diesel engine powered with waste mango seed biodiesel blend	S. Rami Reddy , G. Murali& V. Dhana Raju	International Journal of Ambient Energy	2020-2021	2162-8246
15	Experimental evaluation of diesel engine powered with waste mango seed biodiesel at different injection timings and EGR rates	S. Rami Reddy, G. Murali, AreefAhamadShaik, V. Dhana Raju, M.B.S. Sreekara Reddy	Fuel	2020-2021	0016-2361
16	Simulation of PV And WECS Using CUK and Sepic Converter	M Sivaramkrishna, AVGA Marthanda, K Lakshmi Prasad, Syed Abdul Mujeer, Udaya Kumar Durairaj, Mohammad Salim	IEEE xplore	2020-2021	978-1-6654-4834-5
17	Experimental and Cfd Analysis of Heat Transfer Rate in Multi Air Jet Impingement Over A Flat Plate and Pin-Fin Heat Sink	Syed.Unees Babu, Perumalla Vijay Kumar, K. Lakshmi Prasad	International Journal of Innovative Technology and Exploring Engineering	2020-2021	2278-3075
18	Computational Performance Analysis of an Indirect Evaporative Cooler (IDEC) Unit	Tanneeru Sai Ganesh, P. Ravindra Kumar, K. V.Viswanadh	Test Engineering and Management	2020-2021	0193-4120
19	Experimental investigation on performance of vapour compression refrigeration system with integrated sub-cooling	K.Dilip Kumar, Ch. Chandra Sekhar Reddy, T.Srinivasa Rao, B.PrasannaNagasai	Test Engineering and Management	2020-2021	0193-4120
20	Experimental Study of Heat Transfer Rate in Single and Series Cross Flow Heat Exchanger using Matlab Coding	P.ParabrahmaSai, K.Lakshmi Prasad, P.Ravindra Kumar, K. Srinivasa Rao	International Journal of Engineering and Advanced Technology	2020-2021	2249-8958
21	Experimental research on fixed tube type shell and tube heat exchanger	GunaSahithiMadala, Dilip Kumar K, Jaya Prakash Chilaka, Lakshmi Prasad Kadari	Journal of emerging technologies and Innovative Research	2019-2020	2349-5162
22	Enhancement of COP of vapour compression refrigeration system by using Diffusers	G.Naga Raju, K.Dilip Kumar, T.Srinivasa Rao	International journal of Recent technology and Engineering	2019-2020	2277-3878
23	Assessment of	E.Ramakrishna Reddy,	International Journal of	2019-2020	2162-8246

	performance, combustion and emission characteristics of the diesel engine powered with corn biodiesel blends	Y.Subbalakshmi, V.Dhana Raju K.Appa Rao, M.Harun Kumar, S.Rami Reddy, P.Tharun Sai	Ambient Energy (Taylor & Francis)		
24	Experimental studies on the influence of antioxidant additive with waste tamarind biodiesel on the diverse characteristics of diesel engine	V.Dhana Raju, K.Saibabu, K.Appa Rao, S.Rami Reddy, P.Tharun Sai	International Journal of Ambient Energy. (Taylor & Francis)	2019-2020	2162-8246
25	Novel Water Hyacinth biodiesel as a potential alternative fuel for existing unmodified diesel engine: Performance, Combustion and Emission characteristics	Karthikeyan Alagu, Harish Venu, Jayaprabhakar Jayaraman, V.Dhana Raju, Lingesan Subramani, Prabhu Appavu, Dhanasekar S	Energy (Elsevier)	2019-2020	0360-5442
26	Emission reduction in DI diesel engine using exhaust gas recirculation (EGR) of palm biodiesel blended with TiO <sub>2</sub> nano additives	Harish Venu, L.Subramani, V. Dhana Raju	Renewable Energy (Elsevier)	2019-2020	0960-1481
27	Experimental study on the performance and emission characteristics of corn seed oil methyl ester along with Decanol as an Additive in Diesel engine	K.Madhubabu, B.Prasanth Kumar, A.Naresh Kumar, K.Somasekhar	International Journal of Advanced Research in Science, Engineering and Technology	2019-2020	2350-0328
28	Fabrication and experimental analysis of Absorber based LiBr-Water absorption refrigeration system	Ch.Jaya Prakash, K.Dilip Kumar, T.Srinivasa Rao	International Journal of Engineering and Advanced Technology	2019-2020	2249-8958
29	Energy, Exergy and Energy Audit Analysis of Vijayawada Thermal Power Station	B.Sairamkrishna, P.Vijaya Kumar, Y.Appala Naidu	International Journal of Engineering and Advanced Technology	2019-2020	2249-8958
30	Numerical Simulation of shell and Tube heat exchanger using Ansys Fluent	Kamala Priya B, B.Udaya Lakshmi, A.Hari Krishna	International Journal of Innovative technology and exploring	2019-2020	2278-3075

			Engineering		
31	Experimental Evaluation of Palmyra oil blends in VCR diesel engine by using EGR systems	Pilli Uday Kumar, P.Vijay Kumar, A.Naresh Kumar	International Journal of Innovative technology and exploring Engineering	2019-2020	2278-3075
32	Experimentation on Augmenting Heat Transfer Characteristics of (Ethylene Glycol + Water ) Mixture in a combined (pipe in pipe and Shell & Tube) Heat Exchanger	M.P.V.L. Prasanna, P.Ravindra Kumar, B.Emmanuel, K. Lakshmi Prasad	International Journal of Recent Technology and Engineering	2019-2020	2277-3378
33	Mat Lab Coding and Experimental Analysis of Heat Transfer Rate in Multi Air Jet Impingement	K.Srinivasa Rao, K.Lakshmi Prasad, P.Tharun Sai, M.Pulla Rao	International Journal of Recent Technology and Engineering	2019-2020	2277-3378
34	Fabrication and Experimental Analysis Characteristics of Acetone/Water by using Tube in Tube and Shell and Tube Heat Exchanger	B.Emmanuel, P.Ravindra Kumar, M.P.V.L. Prasanna	International Journal of Innovative technology and exploring Engineering	2019-2020	2278-3075
35	Effect of 1-butanol on the characteristics diesel engine powered with novel tamarind biodiesel for the future sustainable energy source	DLSVN Swamy, Y.Kowsik, V.Dhanaraju, K.Appa Rao, Harish Venu, L.Subramani, K.Bala Prasad	Energy Sources Part A: Recovery, Utilization and Environmental effects	2019-2020	1556-7230, 1556-7036
36	Experimental assessment on the regulated and unregulated emissions of DI diesel engine fuelled with Chlorella emersonii methyl ester (CEME)	Harish Venu, V.Dhana Raju, LingesanSubramani	Renewable Energy	2019-2020	0960-1481
37	Experimental investigation on the performance and emission characteristics of a diesel engine powered with waste mango seed biodiesel blends	B.Prasanth Kumar, K.Appa Rao, V.Dhanaraju, S.Rami Reddy, D.Mallikarjuna Rao, J.Subba Reddy	International Journal of Ambient Energy (Taylor & Francis)	2019-2020	2162-8246
38	Experimental assessment of various fuel additives on the performance and emission characteristics of the spark ignition	T.Srinivas Rao, Sk.JakeerHussain, V.Dhanaraju, Harish Venu, LingesanSubramani	International Journal of Ambient Energy (Taylor & Francis)	2019-2020	2162-8246



	engine				
39	Experimental investigation of Ultrasonic flaw defects in weld clad materials using NDT technique	P. Ravindra kumar, G. Vijay kumar, K. Naga Murali, R. B. S. S. Kishore	A Book Chapter in Lecture Notes in Mechanical Engineering-Springer	2019-2020	2195-4356
40	Effect of EGR on diverse characteristics of diesel engine operated with corn seed biodiesel blend	E.Rama Krishna Reddy, BVS Keerthana, V.Dhana Raju, A.SaiMahith and B.Dhanush	International journal of Ambient Energy	2019-2020	2162-8246
41	Enhancement of Efficacy and heat transfer characteristics of TiO <sub>2</sub> Nano fluids under turbulent flow conditions in parabolic trough collector	K.Dilip Kumar, T.Srinivasa Rao, M.Srinivas, K.Ashok Reddy	International journal of Mechanical Engineering and Technology	2019-2020	0976-6359
42	Optimization of Diesel Engine performance by Taguchi Grey Relational analysis using fuel blends	A.Naresh Kumar, K.Madhu Babu, B.Prasanth Kumar, S.Kiran Kumar, P.S.Kishore	International Journal of Recent Technology and Engineering	2019-2020	2277-3878
43	Experimental study on engine parameters variation in CRDI engine fuelled with palm biodiesel	A.Naresh Kumar, P.S.Kishore, K.Brahma Raju, K.Nanthagopal, B.Ashok	Fuel- Elsevier	2019-2020	0016-2361
44	Influence of decanol as fuel additive on the diverse characteristics of the diesel engine powered with mango seed biodiesel blend	S.Rami Reddy, G.Murali, V. Dhana Raju	International journal of Ambient Energy	2019-2020	2162-8246

### Patents Published by Thermal Science Group members

S.No	A.Y.	Name of the Inventor	Title of the patent	Published Date	Patent Application ID	Status
1	2020-21	Dr.P.Ravindra Kumar	Prevention of food harmfulness from production to customer for centralized kitchen facility using IoT	03.04.2021	2020103242	Published
2	2020-21	Dr.K.Dilip Kumar	An Agricultural Smart Robot Device	28.04.2021	2021101399	Published
3	2020-21	Dr.K.Dilip Kumar	A Sensor Fusion Precision Technology in Agricultural and its method and Controlling	10.5.2021	202121021172	Published

			Parameters			
4	2020-21	Dr.V.Dhana Raju	Aerial Manipulative Omni Directional Drones For Building Construction	11.11.2020	2020102606	Published
5	2020-21	Dr.V.Dhana Raju	Localised Intelligent vehicle electric (LIV-E)	26.02.2021	20202141007160A	Published
6	2020-21	K.Lakshmi Prasad	Generation of E-Bill Transaction Number Using Block chain Technology	05.03.2021	202141007828 A	Published