



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME) under Tier - I

Approved by AICTE and Permanently Affiliated to JNTUK, Kakinada



DEPARTMENT OF MECHANICAL ENGINEERING

One Week online Faculty Development Programme on

“Advancements in Thermal and Renewable Energy Technologies”

ATRET-2022

4th July 2022 - 9th July 2022 ; Timings 10AM to 11.30AM.

The one week online Faculty program was conducted through Microsoft Teams Platform. The registrations for the online FDP was opened on 4-7-2022 at 9.30am and closed on 9-7-2022 at 12.00am. There was a good response from the faculty and research scholars and a total 266 registrations from the participants across the country and overseas. There was 1 faculty member from Saudi Arabia. The total number of participants were limited to 250 members in Microsoft Teams after short listing process is done based on first cum first serve.

Registration link: <https://forms.gle/vKBY3NYxJNFQK8z86>

Registration Fee: Free

Registration Deadline: 01-07-2022

Details of Resource Persons:

DEPARTMENT OF MECHANICAL ENGINEERING

One Week online Faculty Development Programme on

“Advancements in Thermal and Renewable Energy Technologies”

from 4th July 2022 to 9th July 2022 ; Timings 10AM to 11.30AM.

Name of the Resource Person	Designation and Institute
Dr.K.Srinivas Reddy	Professor(HAG) Department of Mechanical Engineering Indian Institute of Technology, Madras Chennai
Dr. S.Kalaiselvam	Professor and Head Department of Applied Science and Technology

Advancements in Thermal and Renewable Energy Technologies

	Anna University, Chennai
Dr. T.Srinivas	Associate Professor Department of Mechanical Engineering National Institute of Technology, Jalandhar
Dr. P.Karthik	Associate Scientific Editor Journal of Sustainable cities and society, Elsevier, CANADA
Dr.R.Parameshwaran	JSPS Postdoctoral Researcher The University of Tokyo, JAPAN
Dr. P.Thirumal	Professor and Head Department of Mechanical Engineering Government College of Engineering, Bargur, Tamilnadu
Dr. Rajesh Baby	Associate Professor and Dean Research Department of Mechanical Engineering St.Joseph's College of Engineering and technology, Palai, Kerala
Dr. R.Senthil	Associate Professor Department of Mechanical Engineering SRM Institute of Science and Technology Chennai

Inauguration Function: The inauguration function of the FDP started on 04-07-2022 at 9.30AM, with the welcome address by the Convener, Dr.S.Pichi Reddy, Professor & HoD, Department of Mechanical Engineering followed by the key note address by the distinguished guest and resource person, Dr.K.Srinivas Reddy, Professor, Department of Mechanical Engineering, Indian Institute of Technology, Madras. Later the Principal of LBRCE Dr.K.Appa Rao addressed the participants and emphasized the importance of knowledge transfer to the student fraternity after attending the FDP by Faculty members. The inaugural function concluded at 9.45AM. The session on day-1 started with Dr.K.Srinivas Reddy optimization of solar thermal systems. There were total 8 sessions conducted and the details are as given below.

Table 1: Details of Resource Persons and topic delivered

Dates	Name of the Resource Person	Topic Covered
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04.7.2022	Prof.K.Srinivas Reddy, Indian Institute of Technology, Madras. Topic Delivered: Optimization of solar thermal systems
04.7.2022	Dr.S.Kalaiselvam, Anna University, Chennai Topic Delivered: Thermal energy storage system for sustainable green buildings
05.7.2022	Dr. T.Srinivas, NIT Jalandhar Topic Delivered: Simulation and optimization of thermal systems
06.7.2022	Dr.P.Thirumal, Govt.College of Engineering, Bargur, Tamilnadu Topic Delivered: Indoor air quality investigation and prediction in an automobile-case study
07.7.2022	Dr.R.Parameshwaran, JSPS, Researcher, The University of Tokyo, JAPAN Topic Delivered: The known and unknown things about Nano fluids: Fundamentals to applications
07.7.2022	Dr.P.Karthik, Associate Scientific Editor, Journal of Sustainable cities and society, Elsevier, CANADA Topic Delivered: Building energy modeling data inputs and sustainable cities
08.7.2022	Dr.Rajesh Baby, Dean-Research, SJ CET, Palai, Kerala Topic Delivered: Thermal system optimization using ANN –Genetic Algorithm approach.
09.7.2022	Dr.R.Senthil, Associate Professor, SRMIST, Chennai Delivered: Thermal energy storage for solar collectors.

Outline of the topics covered in FDP

Solar energy potential, harnessing methods, storage and utilization for different applications. The solar energy optimization methods.

Green energy codes, its rating, net zero energy buildings, the mixing of nanoparticles in phase change materials for reducing the freezing time, the preparation of variety of nanoparticles for reducing the energy and enhance energy storage systems.

The importance of modeling, simulation, analysis and optimization in solving the complex engineering problems. Lagrangian multiples method used for thermal system optimization.

Air quality and its importance, the most common inherent impurities in air, indoor air quality investigation nad prediction in an automobile with case study.

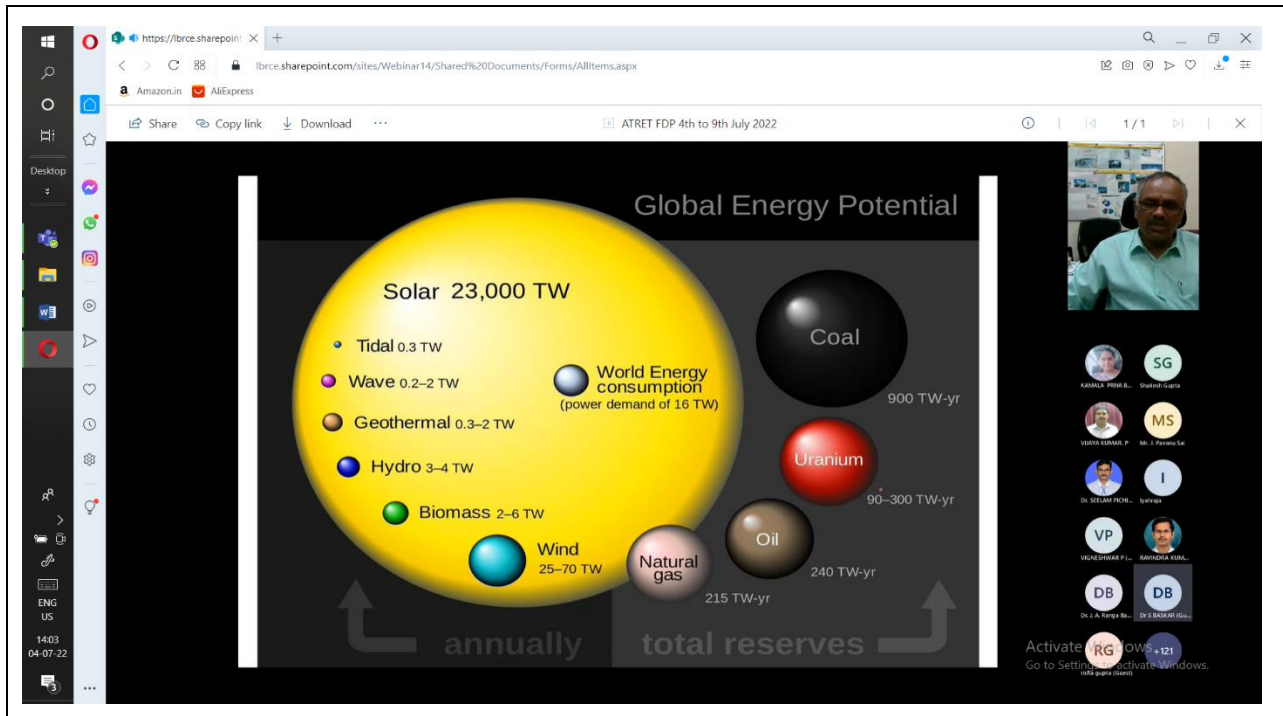
Battery thermal management system, introduction to artificial neural networks, thermal optimization of PCM based pin fin heat sinks, .optimization of pin fin heat sink with ANN-GA approach, the use of nntool in MATLAB.

Thermal energy storage methods, sensible heat type, latent heat type, PCM based thermal energy storage, its salient features, different types, application of PCM based thermal energy storage in solar collectors, energy storage capacity.

Day-1: 04-07-2022, Session-1, Prof.K.Srinivas Reddy, IIT, Madras, Chennai

The figure consists of four screenshots from a Zoom meeting, arranged in a 2x2 grid. Each screenshot shows a presentation slide with a Zoom interface overlay on the right side.

- Top-left screenshot:** Title slide for "One week online FDP on 'Advancements in Thermal and Renewable Energy Technologies (ATRET-2022)'" by Prof. K. S. Reddy, Department of Mechanical Engineering, L. B. Reddy College of Engineering, Mylavaram-521230, dated 4th July 2022. The main topic is "Techno-Enviro-Economic Optimization of Solar Thermal Systems".
- Top-right screenshot:** Slide titled "Energy Sources". It states that energy sources are grouped into two categories: Celestial or Income Energy (reaching earth from outer space) and Capital Energy (already exists on earth). It also lists Energy Reserves: Renewable/Nondepletable (Solar, Wind, Biomass, Ocean), Fossil fuels (Coal, Oil, Natural Gas), Fissionable and fertile isotopes (Nuclear), and Fusionable isotopes.
- Bottom-left screenshot:** Slide titled "Global Energy Poverty". It features a world map with colored regions and statistics: 56% of people in South America have access to electricity, 99% in South Asia, and 53% in sub-Saharan Africa. A text box states: "1.6 billion people have no access to electricity, 80% of them in South Asia and sub-Saharan Africa".
- Bottom-right screenshot:** Slide titled "Solar Energy Technologies for Decarbonisation" listing 17 topics:
 - Design and development of fuzzy logic controllers for solar parabolic dish collector system for process heat and power generation
 - Propose an atlas for Concentrating Solar Power generation in India
 - Design & development of active and passive cooling with heat recovery for concentrating photovoltaic (CPV) systems
 - Development of porous enhanced energy efficient receiver for solar parabolic trough collector for performance improvement and direct steam generation
 - Design of integrated Torque Tube-Bow support structure for solar parabolic trough collector
 - Design and Development of Troughed Cavity Receivers for Solar LWR Power Systems
 - Design and Development of TIM covered Solar ICJ Water-Heaters
 - Design & Development of Tracking Systems Single and Two-axis orientation of Solar Systems
 - Design and Development of a Stack-IE Elliptical Hyperboloid Concentrator for Process Heat Applications
 - Development of High-yield Multi-Phase Solar desalination system
 - Development of Vertical Solar Still for Potable Water Production
 - Development of Flat Bed Solar Still for Wastewater Treatment
 - Development of Solar Dryer for Conversion of Human Waste into Fuel/Biom
 - Design and development of solar energy driven bacillo effluent treatment system
 - Design and Development of Solar Energy based zero-discharge Toilet
 - Development of Solar Power (Electric-Auto) Rickshaw for Sustainable Transport system.
 - Demonstration of Biogas based Renewable Energy System for Sustainable Power Generation
 - Design and Development of Integrated Renewable Energy Systems (IRES) for North Eastern Rural Communities
 - Integration-Center-Commercial-Residing (CCCR) of Renewable Energy Systems (RES) for Reliable and Flexible Energy Generation
 - Separate Gender- Hot Water (SGHW) Apparatus for Thermal Characterisation of Engineering/Building Materials



Day-1: 04-07-2022, Session-2, Dr.S.Kalaiselvam, Professor, Anna University, Chennai

Nanotechnology for Energy

- Increased surface area
- Interface and size effects

Molecules $\Delta \lambda = 1-300 \text{ nm}$ $\lambda = 100 \text{ nm}$ $\lambda = \text{wavelength}$ $\lambda = 10 \text{ nm}$ Photons

Electrons $\lambda = 10 \text{ nm}$ $\lambda = 10 \text{ nm}$ Phonons $\lambda = 10 \text{ nm}$ $\lambda = 10 \text{ nm}$

Thermodynamics • Kinetics

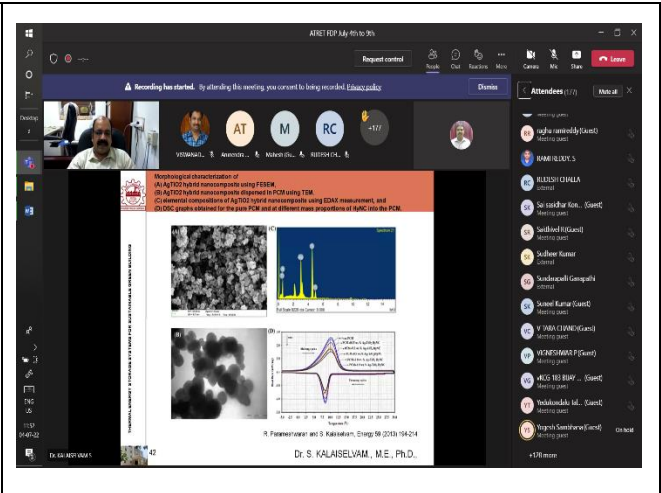
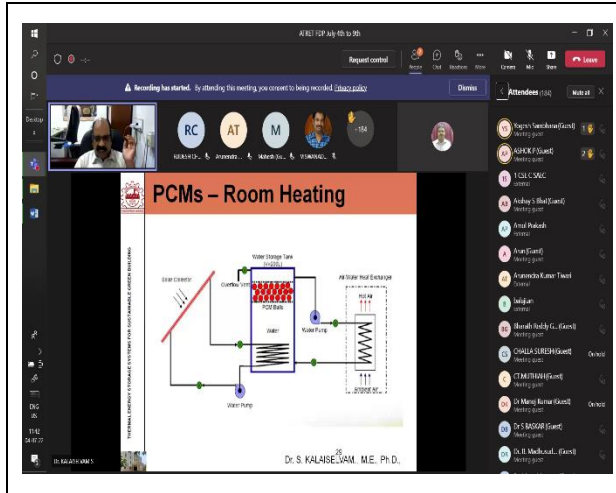
Dr. S. KALAISELVAM, M.E., Ph.D.

PCM in A/C Chiller Plants

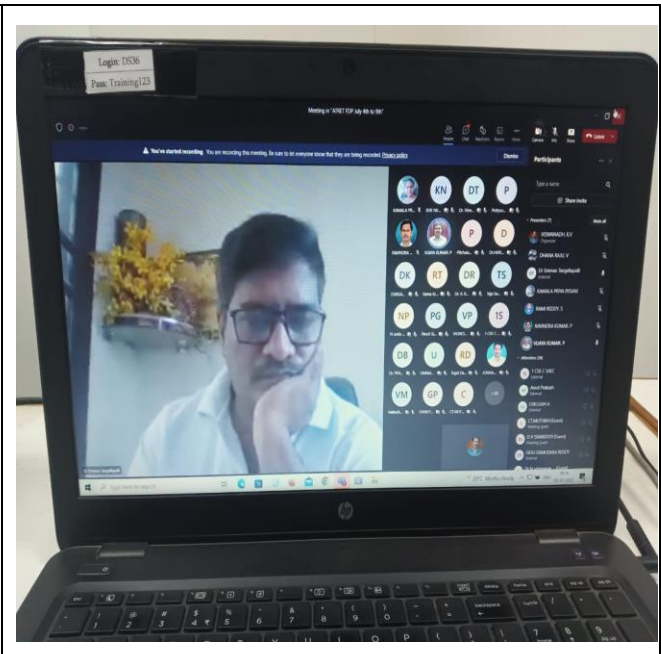
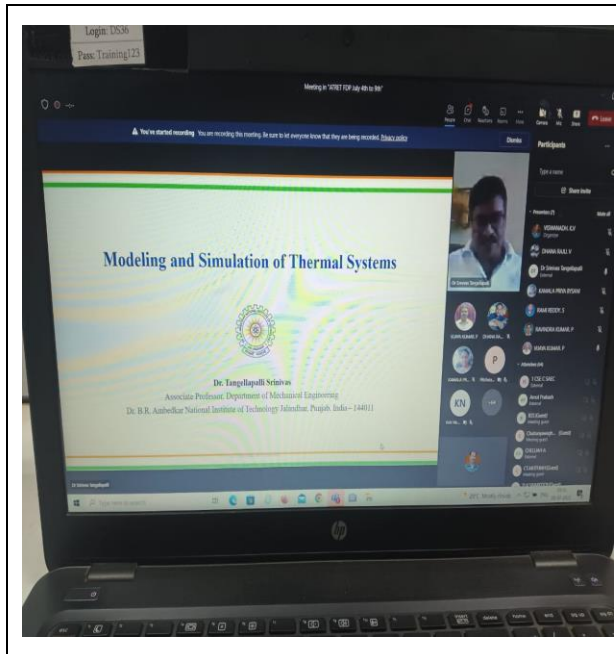
Chiller -> PCM Storage Tank -> Load

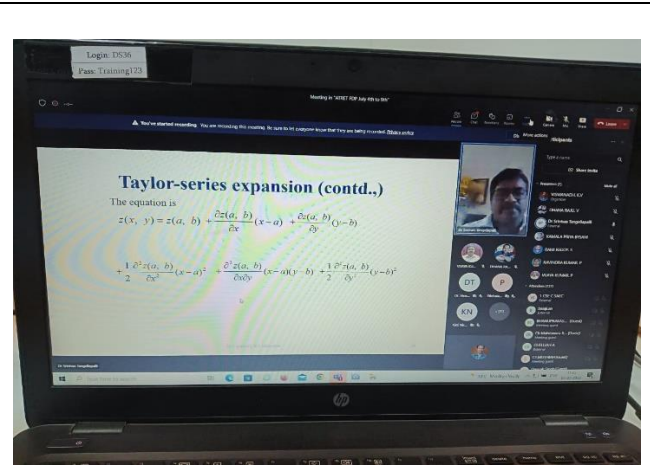
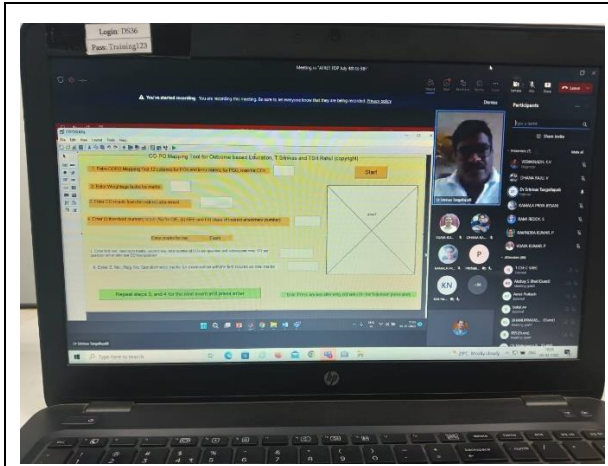
- Power requirement is reduced in peak hours by using PCM storage tanks
- The PCM is charged by chiller when the load doesn't require cooling or requires only partial cooling
- Fluid is bypassed from pump to PCM tank instead of passing through chiller during the peak hours
- Peak loads are reduced by making use of energy stored during off peak hours
- PCM's temperature range: -10 to $+20$ °C

Dr. S. KALAISELVAM, M.E., Ph.D.

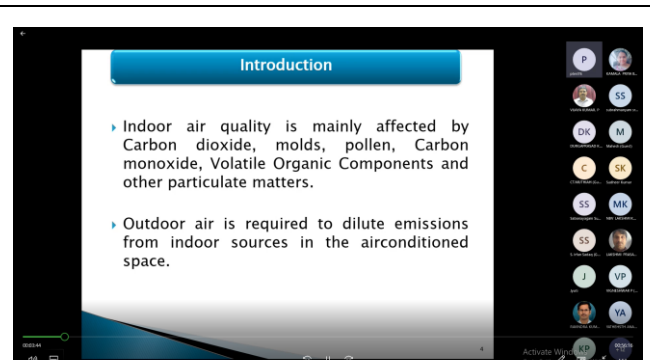
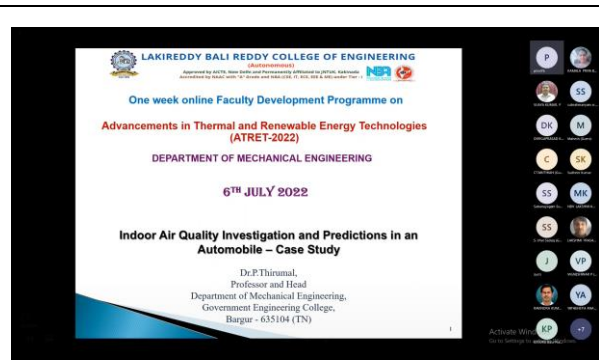


Day-2: 05-07-2022, Dr.T.Srinivas, NIT, Jalandhar

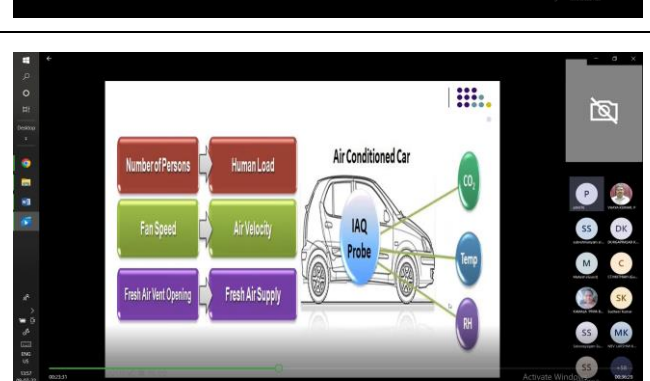




Day-3: 6-07-2022, Dr.P.Thirumal, Govt. College of Engineering, Bargur, Tamilnadu



Parameters	Unit	Ideal Range	Effects
CO ₂ - Carbon Dioxide	ppm (partes per million)	300 - 800 ppm	Drowsiness, headaches, loss of attention...
PM 10 - Particles < 10 µm in diameter	µg/m ³	max 150 µg/m ³ (exposure 24h)	Respiratory and cardiovascular diseases, asthma and respiratory infections.
PM 2.5 - Particles < 2.5 µm in diameter	µg/m ³	max 35 µg/m ³ (exposure 24h)	Because of their size, they pass through the lung barrier and enter the bloodstream, making them one of the most dangerous particles, as they are practically invisible and the body's defenses are not effective in stopping them.
VOCs - Volatile Organic Compounds	mg/m ³	Depends on the compound	Short term: headaches, coughing, eye irritation. Long term: anxiety, asthma.
Temperature	°C	18 - 21°C winter 24 - 26°C summer	Outside this range, people enter the discomfort zone. Loss of concentration, complaints, cold, etc.
Humidity	%	40 - 60%	Outside this range, humidity helps the survival of viruses, bacteria, fungi and dust mites.



Day-4: 7-07-2022, Session-1, Dr.R.Parameshwaran, JSPS Postdoctoral Researcher, The University of Tokyo, JAPAN

Meeting in "2022 FDP July 04 to 09"

One week online Faculty Development Program
(4th July 2022 to 9th July 2022)

on
Advancements in Thermal and Renewable Energy Technologies

Dr. P. Vijaya Kumar & Dr. Y. Dhana Raju (Co-organisers)
Dr. S. Pichi Reddy (Convener)
Dr. K. Appa Rao (Principal)

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L.B.Reddy Nagar, Mylavaram, Andhra Pradesh 522308

Meeting in "2022 FDP July 04 to 09"

The Known and Unknown about Nano fluids:
Fundamentals to Applications

Presented By
Dr. R. Parameshwaran
JSPS Postdoctoral Researcher
Department of Mechanical Engineering
Graduate School of Engineering
The University of Tokyo

Associate Professor
Department of Mechanical Engineering
BITS-Pilani Hyderabad Campus
Hyderabad, India

東京大学
THE UNIVERSITY OF TOKYO

Meeting in "2022 FDP July 04 to 09"

Classification of Solid Nanostructured Materials

0-D: All dimensions of the nanomaterial are 0-D.

1-D: Two dimensions of the nanomaterial, one dimension of the nanomaterial.

2-D: One dimension of the nanomaterial, two dimensions of the nanomaterial.

3-D: No dimensions of the nanomaterial, all dimensions of the nanomaterial.

Meeting in "2022 FDP July 04 to 09"

Size of Particles

0.1 nm to 1 nm

1 nm to 100 μm

100 nm to 1 μm

1 μm to 100 μm

100 μm to 10 mm

Research highlights on building energy systems

- Thermal energy storage systems
- Urban Building Energy Modeling
- Occupancy behavior modelling

Karthik Panchabikesan, Ph.D.,
Associate Scientific Editor
Elsevier.

July 07, 2022

So I have 3 topics today there manager storage systems urban building energy modeling and occupancy behavior

Phase change materials for building free cooling applications – Ph.D. work summary

Experimental analysis

- Formulation of experimental setup & conduct of experiments using different PCM's under different ambient conditions
- Highly dense
- Medium dense
- Material investigation: Non-PCM data collection, heat transfer calculations
- Software used: Engineering Equation Solver, EnergyPlus, OpenStudio

Numerical analysis & Parametric study

- Finite element model
- Validation of the model: numerical model using the experimental results
- Parametric study on observing the optimal thermal conductivity of PCM and surface heat transfer coefficient
- Software used: Fortran Software for Environment computation (FSEC-VUE)

Free cooling potential assessment throughout India

- System design and combination: based on the numerical study input and experimental system configuration
- Free cooling potential assessment of PCM based storage systems for 17 major cities were carried out
- Experiment results were cross-verify the results of cooling potential assessment study
- Major cities where the proposed cooling system could be successfully implemented were identified and the CO₂ mitigation savings was calculated

Concept

Operational principle of Free cooling system (left), and enhanced free cooling system (right) during PCM solidification.

happened mainly with the pre cooling so the left trigger is the normal 3 cooling You have a fan

Why UBEM and why simulation inputs are important ?

- Accurate load/demand estimation with reduced uncertainty
- Dynamic building performance simulation
- Optimized renewable energy design and operation
- Optimized energy storage system design
- Smart building operation
- Energy efficiency
- Uncompromised thermal comfort
- Occupant centric building operation

carbon dioxide and what is the application of renewable energy? Measure its building? And what is more important for the thermal and dynamic

Data driven occupancy information for energy simulation and energy use assessment in residential buildings

Step 1: Data preparation (Building IT, Data preparation, Pre-processed dataset)

Step 2: Data driven occupancy information (Step 1, Data driven occupancy information, Data driven energy use assessment)

Panchabikesan, K., Haghghaj, F., & El-Markabi, M. (2021). Data driven occupancy information for energy simulation and energy use assessment in residential buildings. Energy, 218, 119539.

The machines are common term but then based on your data you can use it for any applications and you will have wonderful different results across the

Day-5: 8-07-2022, Friday

Dr.Rajesh Baby, Dean Research, SJCT

Overview

- Introduction
- Battery Thermal Management System (BTMS)
- Introduction to Artificial Neural Networks (ANN)
- Thermal optimization of PCM based plate fin heat sinks
- Optimization pin fin heat sinks by hybrid ANN-GA technique
- mtool in Matlab
- Conclusions

Causes and effects of battery temperature on safety and performance

Battery cell temperature	Cause	Leads to	Effect
High	Electrolyte decomposition	Irreversible lithium loss	Capacity fade
	Continuous side reactions at low rate	Impedance Rise	Power fade
Low	Decrease of accessible anode surface for Li-ion intercalation	Low of mechanical stability	Capacity fade
	Decomposition of binder	Maximum cycle life	
15 °C - 24 °C			Superior energy storage capacity
Low	Lithium plating	Irreversible loss of lithium	Capacity/ power fade
	Electrolyte decomposition		

Introduction to Optimization

- Optimization is the act of obtaining the best result under the given circumstances.
- Design, construction and maintenance of engineering systems involve decision making both at the managerial and the technological level
- Minimizing the effort required or to maximizing the desired benefit are the goals of such decisions

An Example

Diagram showing a neural network with inputs $X_1=1, X_2=2, X_3=0, X_4=0$ and weights $W_1=1, W_2=1, W_3=1, W_4=1$. The output is $Y=1$.

Fig. Neuron Structure of Example

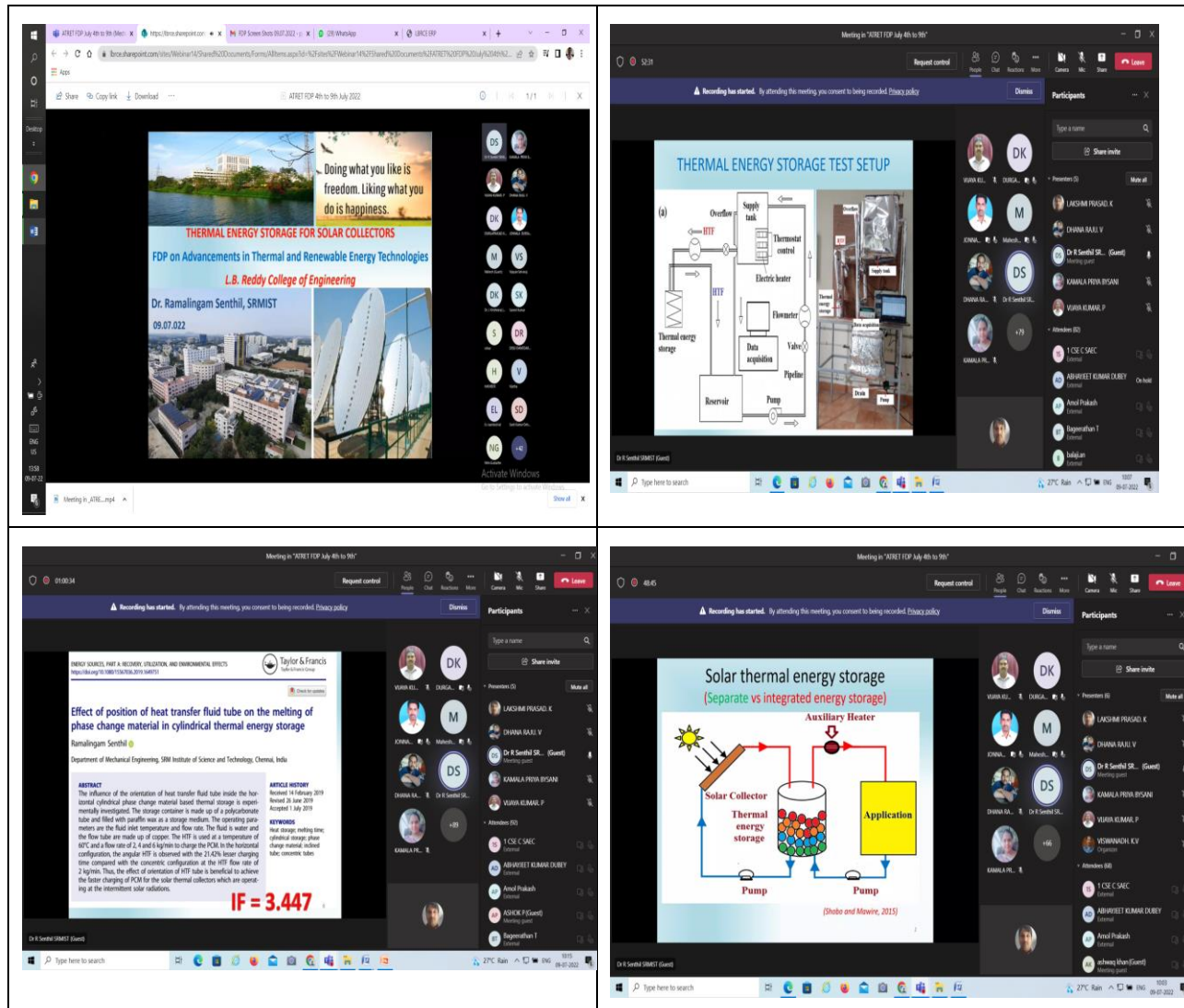
The output z of the network, prior to the activation function stage, is

$$z = X^T \cdot W = \begin{bmatrix} 1 & 2 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \end{bmatrix} = 4$$

With a binary activation function $y = \text{Threshold}(z) = 1$

Day-6: 9-07-2022 Saturday

Dr.R.Senthil, SRMIST, Chennai





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from 4th July 2022 to 9th July 2022 ; Timings 10AM to 11.30AM.

Program Objective: To impart the knowledge of advancements and current research in the area of thermal and renewable energy technologies happening around the globe.

Program Outcomes: The participants able to

1. Understand the importance of developing the thermo-economic- environment thermal and renewable energy systems
2. Comprehend the variety of thermal and renewable energy storage systems
3. Recognize the significance of modelling, simulation, analysis and optimization of thermal systems for solving complex engineering problems
4. Know the importance of developing the green energy systems and net zero energy buildings
5. Apply the ANN and genetic algorithms for optimization of thermal energy storage systems
6. Develop the nanoparticle base technology for thermal equipment performance enhancement

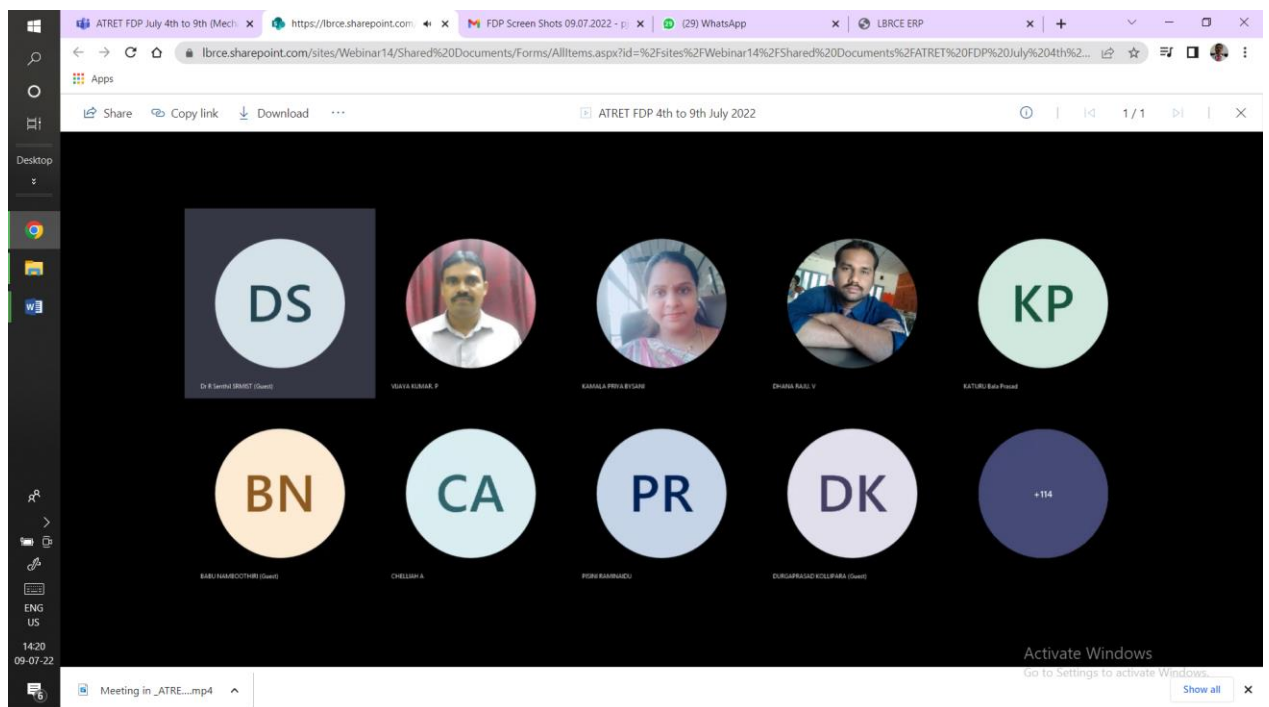
COORDINATORS

1.Dr.P.Vijay Kumar **2.Dr.V.Dhanaraju**
Professor Assoc.Professor

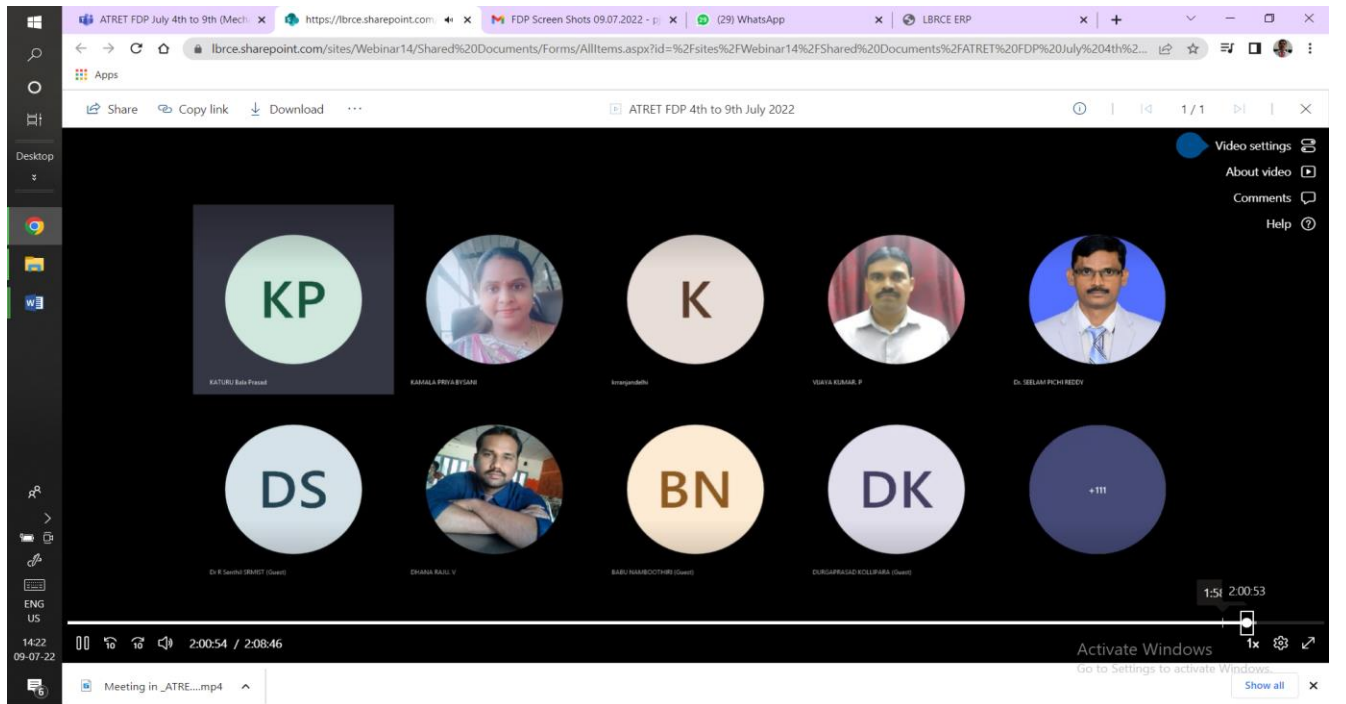
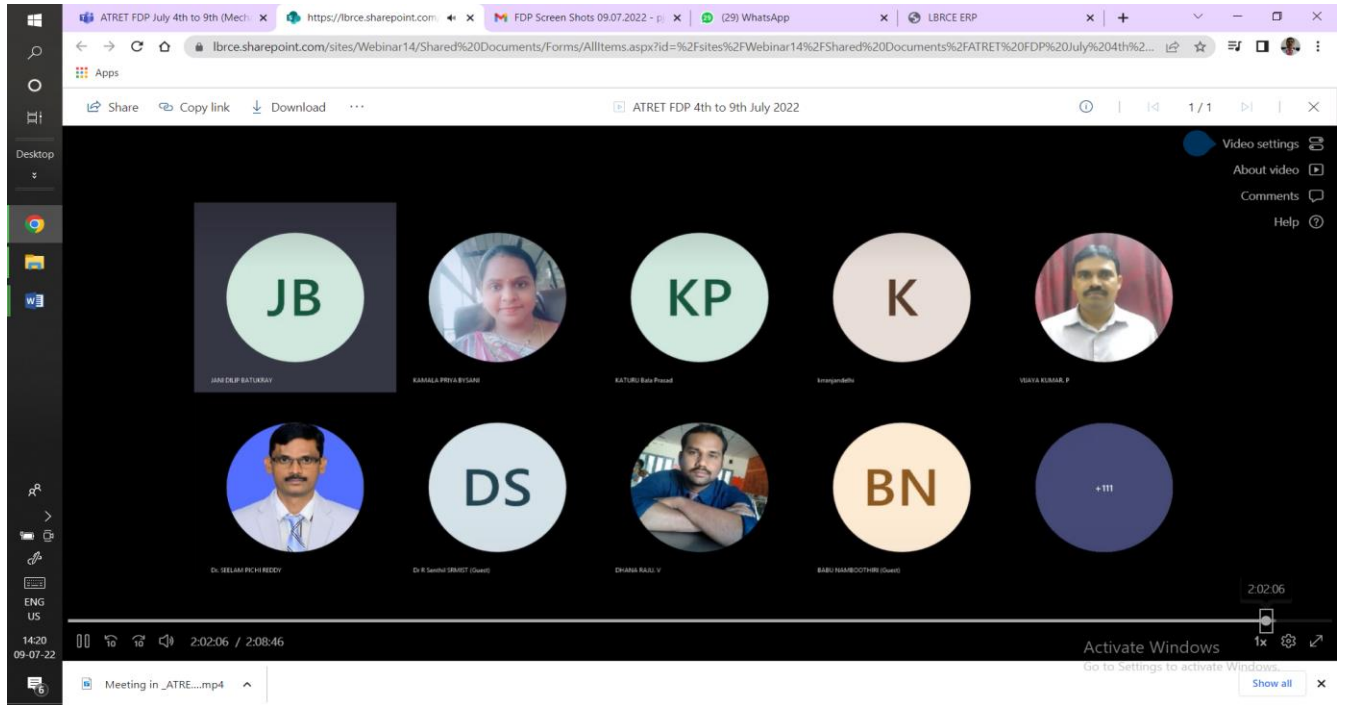
CONVENER

Dr.S.Pichi Redd
Professor and Head

Valedictory Function Images, Conversation of Dr.K.AppaRao, Principal and Dr.R.Senthil, Associate Professor, SRM Institute of Science and Technology, Chennai



Lakireddy Bali Reddy College of Engineering- MED_ Online FDP: 4-07-2022 to 9-07-2022



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on
**Advancements in Thermal and
Renewable Energy Technologies**

Dr. P. Vijaya Kumar &
Dr.V.Dhana Raju
(Co-ordinators)

Dr. S.Pichi
Reddy
(Convenor)

Dr. K.Appa Rao
(Principal)



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(ATRET-2022)
4th July – 9th July 2022
Program Schedule

S. No	Day	Date & Time	Resource Person	Topic to be delivered
DAY-1				
1	MONDAY	04-07-2022 9.30AM - 11.00AM	Dr. K.Srinivas Reddy, Professor of Mechanical Engineering, Indian Institute of Technology, Madras.	Optimization of Solar thermal systems

Advancements in Thermal and Renewable Energy Technologies

2	MONDAY	04-07-2022 11.00AM - 12.30PM	Dr. S.Kalaiselvam, Professor and Head Department of Science and Technology, Anna University, Chennai.	Thermal energy storage systems for sustainable green building
DAY-2				
3	TUESDAY	05-07-2022 10AM - 11.30AM	Dr. T.Srinivas, Associate Professor Department of Mechanical Engineering, National Institute of Technology, Jalandhar.	Simulation and optimization of thermal systems
DAY-3				
4	WEDNESDAY	06-07-2022 10AM - 11.30AM	Dr.P.Thirumal, Professor and Head Department of Mechanical Engineering, Government Engineering College, Bargur	Air-conditioning and air quality issues – Case studies
DAY-4				
5	THURSDAY	07-07-2022 3PM - 4.30PM	Dr. R.Parameshwaran, JSPS Post-Doctoral Researcher The University of Tokyo, Japan	The known and unknown about Nanofluids: Fundamentals to Applications
6	THURSDAY	07-07-2022 4.30PM – 6PM	Dr.P.Karthik Associate Scientific Editor Elsevier, Journal of Sustainable Cities and Society, Canada	Building energy modelling, data inputs and Sustainable cities

DAY-5				
7	FRIDAY	08-07-2022 10AM - 11.30AM	Dr.Rajesh Baby, Dean-Research, St.Joseph's College of Engineering and Technology, Palai, Kerala	Thermal system optimization using artificial neural network – Genetic algorithm approach
DAY-6				
8	SATURDAY	09-07-2022 10AM - 11.30AM	Dr.R.Senthil, Associate Professor, Department of Mechanical Engineering, SRM Institute of Science and Technology Kattankulathur, Chennai	Thermal energy storage for solar collectors

Resource Persons

Dr.K.S.Reddy, Professor, IIT Madras
 Dr.P.Karthik, Associate Scientific Editor, Elsevier, Journal of Sustainable Cities and Society, CANADA
 Dr. R.Parameashwaran
 JSPS Post-Doctoral Researcher, The University of Tokyo, TOKYO, JAPAN
 Dr. S.Kalaiselvam, Professor, Anna University, Chennai
 Dr.T.Srinivas, Associate Professor NIT, Jalandhar
 Dr.P.Thirumal, GCE, Bargur
 Dr.Rajesh Baby, SJCTET, Palai,
 Dr.R.Senthil, SRMIST, Chennai

Registration Fee:

- No Registration Fee.

Target Audience:

Faculty and research scholars from the state, spread across India and Abroad

Important Date:

Last Date for Registration: 1/07/2022

Registration Link:

Fill the Registration form with the following link:
<https://forms.gle/vKBY3NYxJNFK8z86>
 Join the Whatsapp group to get the updates:
<https://chat.whatsapp.com/HyRLHA3tYXl7teh9vrfMWc>
 Online FDP will be organized in Microsoft Teams Platform

Certificate Criteria:

- All eligible candidates will be given e-certificates.
- Attendance is mandatory

For more details contact:

Dr.P.Vijaya Kumar: +91-9490817851
 Dr. V.Dhana Raju:+91-9848363670

Committee Members

Chief Patrons

Sri. L.Jaya Prakash Reddy, Honorary Chairman
 Sri. L.R.N.K.Prasad Reddy, Chairman
 Sri. L.Vijaya Kumar Reddy, Vice Chairman

Patrons

Sri G. Srinivasa Reddy, President
 Dr. K. Appa Rao, Principal
 Dr. K. Harinadha Reddy, Vice-Principal
 Dr. M. Srinivasa Rao, Dean Academics
 Dr.E.V.Krishna Rao, Professor, Dean R&D

Convener

Dr.S.Pichi Reddy, Professor & HOD, ME

Coordinators

Dr.P.Vijaya Kumar, Professor
 Dr.V.Dhana Raju, Assoc.Professor

Co-Coordinator

Mr. K.V.Viswanadh, Sr.Assistant Professor
 Mr. S.Rami Reddy, Sr.Assistant Professor
 Mr. K.L.Prasad, Assistant Professor

Advisory committee

Dr.P.V.Chandrasekhara.Rao, CoE and Professor of Mech Engg
 Dr.P.Ravindra Kumar, Professor
 Dr.K.Dilip Kumar, Professor

Organizing committee

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 Mr.J.Subba Reddy, Associate Professor
 Dr.M.B.S.Sreekara Reddy, Assoc. Professor
 Dr.K.Murahari, Associate Professor
 Dr. Ch.Siva Sankara Babu, Sr. Asst Professor
 Mr.B.Sudheer Kumar, Sr.Assistant Professor
 Mr.S.Srinivasa Reddy, Sr.Assistant Professor
 Mr.A.Nageswara Rao, Sr.Assistant Professor

ONE WEEK ONLINE

FACULTY DEVELOPMENT PROGRAM

On

ADVANCEMENTS IN THERMAL AND RENEWABLE ENERGY TECHNOLOGIES

(4th - 9th July, 2022)



Organized by

Department of

Mechanical Engineering
 (Accredited by NBA under Tier - I)

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 L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.- 521 230

About the Institute:

LBRCE was founded through Lakireddy Bali Reddy charitable trust in 1998 which stands for quality technical education that is exemplified by the continuous strides taken towards excellence in the last two decades. LBRCE started with an intake of 180 and is reached to the current intake of 1164. UGC has accorded Autonomous Status in the year 2010, subsequently renewed in 2016, valid up to 2022. LBRCE has been accredited by NAAC with Grade 'A' and NBA (ECE, IT, CSE, EEE & MECH) under Tier-I. The College has also been awarded 2(f) and 12(B) status, apart from the recognition as a 'College with Potential for Excellence (CPE)' status from the UGC. Our institute has pride to have large pool of well-qualified and experienced faculty.

About the Department:

The Department of Mechanical Engineering was started in the year 1998. It has well qualified faculty and well equipped laboratories.

The Department is accredited by NBA under Tier-I. About 25% of faculty members having doctoral degree. JNTUK Kakinada has accorded Research Centre to the Department and several research scholars are pursuing their Ph.D. The Department received sponsored research projects worth Rs. 1.5 Crore from various GOI funding agencies.

About the FDP:

The one week online FDP is aimed at enriching the knowledge and research capabilities of faculty and research scholars of academia and R&D centers working in the area of thermal and renewable energy technologies. This FDP also covers simulation, modeling and optimization techniques.

This program is useful for participants who are doing research work in the performance enhancement and optimization of thermal and renewable energy systems area.

Eminent professors from India and Abroad are drawn from the highly reputed institutes (IIT, NIT, R&D centers) have been invited for FDP.

Objectives of the FDP:

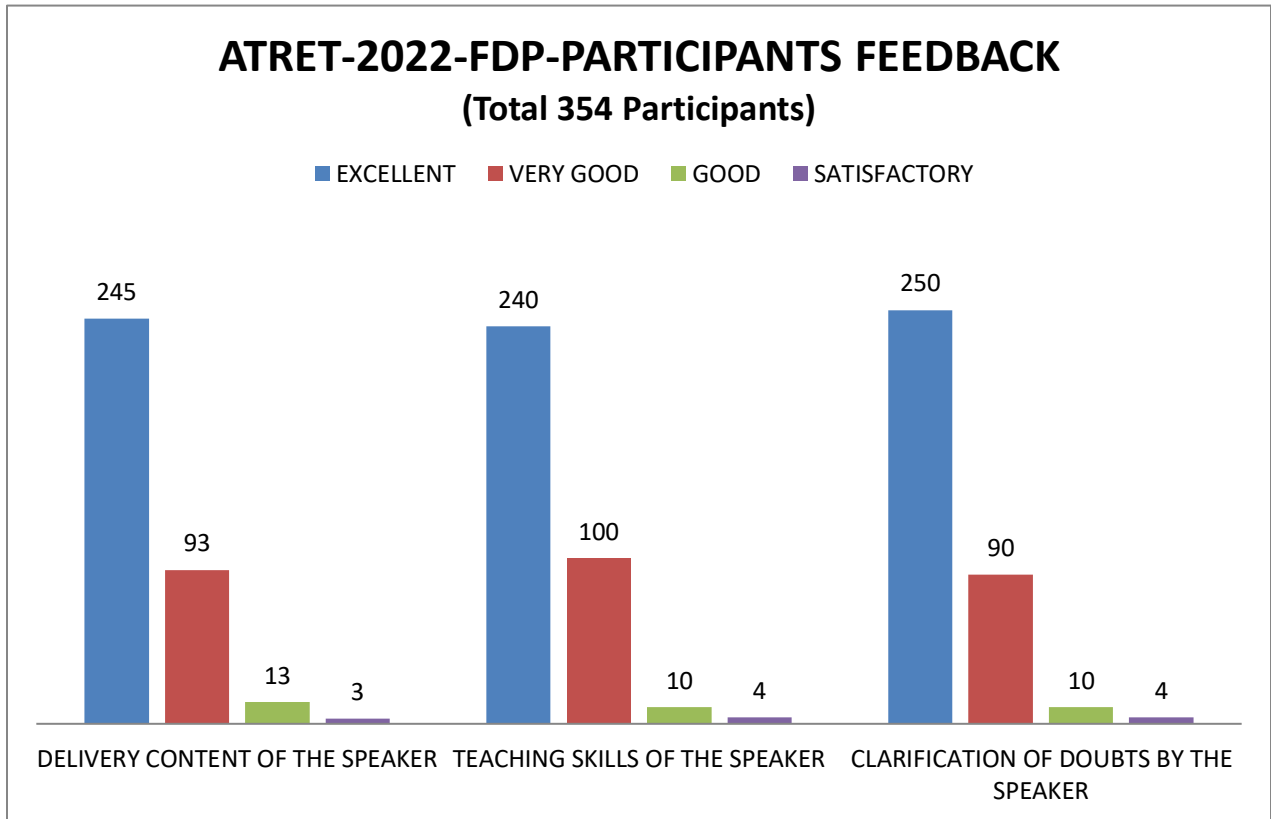
- > To know the latest developments in thermal and renewable energy technologies.
- > To get exposed to the latest simulation and modeling techniques.
- > To get acquainted with the advancements in optimization methods.

Topics to be covered:

- > Optimization of solar thermal systems
- > Building energy modeling data inputs and sustainable cities
- > The known and unknown things about Nanofluids: Fundamentals to Applications
- > Thermal energy storage systems for sustainable green building
- > Simulation and optimization of solar thermal systems
- > Thermal system optimization using ANN-Genetic algorithm approach
- > Thermal energy storage for solar collectors
- > Air-conditioning system air quality issues - Case studies

Learning Outcomes:

- > Understand thermal and renewable energy system performance enhancement methods.
- > Optimize the performance parameters of thermal and renewable energy systems.
- > Develop energy efficient thermal and renewable energy storage systems.




Dept of Mechanical Engineering
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