



**KARUNYA INSTITUTE OF TECHNOLOGY AND SCIENCES**  
(Declared as Deemed to be University under Sec. 3 of the UGC Act 1956)  
A CHRISTIAN MINORITY RESIDENTIAL INSTITUTION  
AICTE Approved & NAAC Accredited  
Karunya Nagar, Coimbatore - 641 114, Tamil Nadu, India

## **DEPARTMENT OF MECHANICAL ENGINEERING**

### **HEAT TRANSFER LABORATORY**

Heat Transfer laboratory provides fundamental and industrial knowledge about modes of heat transfer, like conduction, convection and radiation, and their application. The objective of this laboratory is to provide the students a good environment to understand concepts and applications of heat transfer in the field of Engineering. Performance and heat transfer calculations for extended surfaces, heat transfer coefficient calculations in free and forced convection systems, radiation heat transfer calculations, two phase flow heat transfer and Critical heat flux analysis taught in the lab. This laboratory is also involved in advanced research in enhanced heat transfer, solar energy, heat pipes and thermoelectric cooling of high heat flux electronic devices.

#### **COURSE OBJECTIVES:**

To impart knowledge on

1. The heat transfer characteristics of various heat transfer apparatus
2. The design calculations of different modes of heat transfer
3. Conducting the heat transfer experiments and practically learn how to find heat transfer coefficients

#### **COURSE OUTCOMES:**

After completing the course the students will be able to

1. Calculate and compare the thermal conductivity of different materials.
2. Predict the convective heat transfer coefficient by free convection.
3. Analyze the performance of forced convective heat transfer coefficient through pin –fin.
4. Evaluate the performance of radiation through black and gray bodies.
5. Analyze the performance parameters of parallel flow heat exchanger.
6. Analyze the performance parameters of counter flow heat exchanger

## Facilities available for regular class work, project, research and consultancy

- ✓ Composite wall apparatus.
- ✓ Lagged pipe apparatus.
- ✓ Guarded plate apparatus.
- ✓ Natural convection apparatus.
- ✓ Pin-fin by forced convection apparatus.
- ✓ Forced convection apparatus.
- ✓ Emissivity apparatus.
- ✓ Stefan-Boltzmann apparatus
- ✓ Parallel and Counter flow heat exchanger.
- ✓ Drop-wise and film-wise condensation apparatus
- ✓ Nucleate boiling apparatus
- ✓ Critical heat flux apparatus
- Transient heat transfer unit apparatus

## Major equipment's



**Fig. 1 Drop-wise and film-wise condensation apparatus**



**Fig. 2 Critical heat flux apparatus**



**Fig. 3 Transient heat transfer unit apparatus**



**Fig. 4** Forced convection apparatus



**Fig. 5** Natural convection apparatus



**Fig. 6 Emissivity apparatus**



**Fig. 7 Lagged pipe apparatus**

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Lab technicians: Mr. R.Jayaseelan, Mechanic Grade1

