



# MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

## DEPARTMENT OF MECHANICAL ENGINEERING

### 2060381 HEAT TRANSFER LAB

B.Tech.III Year-II Sem

L/T/P/C  
0/0/3/1.5

### VISION

The Mechanical Engineering Department strives for immense success in the field of education, research and development by nurturing the budding minds of young engineers inventing sets of new designs and new products which may be envisaged as the modalities to bring about a green future for humanity”.

### MISSION

Equipping the students with manifold technical knowledge to make them efficient and independent thinkers and designers in national and international arena. Encouraging students and faculties to be creative and to develop analytical abilities and efficiency in applying theories into practice, to develop and to disseminate new knowledge. Pursuing collaborative work in research and development organizations, industrial enterprises, research and academic institutions of national and international standards, to introduce new knowledge and methods in engineering teaching and research in order to orient young minds towards industrial development.

### LIST OF EXPERIMENTS

1. Determination of overall heat transfer co-efficient of a composite slab..
2. Determination of heat transfer rate through a lagged pipe.
3. Determination of heat transfer rate through a concentric sphere.
4. Determination of thermal conductivity of a metal rod.
5. Determination of efficiency of a pin-fin.
6. Determination of heat transfer coefficient in forced convection.
7. Determination of heat transfer coefficient in natural convection.
8. Determination of effectiveness of parallel and counter flow heat exchangers.
9. Determination of emissivity of a given surface.
10. Determination of Stefan Boltzmann constant.
11. Determination of heat transfer rate in drop and film wise condensation.
12. Determination of critical heat flux.
13. Demonstration of heat pipe.
14. Determination of Heat transfer coefficient and instantaneous heat transfer for transient heat conduction.

### COURSE OUTCOMES

CO	Course outcome
ME 381.1	Applications of concepts of Conduction, Convection & Radiation Principles.
ME 381.2	Calculation of thermal conductivity Heat transfer coefficient of various experiments.
ME 381.3	Calculation of heat transfer coefficient of various experiments.
ME 381.4	Analyzing the performance parameters of HeatExchanger.
ME 381.5	Evaluation of emissivity of real surfaces
ME 381.6	Assessment of Stefan boltz's mann constant.



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#### PROGRAM EDUCATIONAL OBJECTIVES

PEO1	Graduates shall emerge as successful Mechanical engineer's as their career progress
PEO2	Graduates apply fundamentals of engineering, in practical applications and engage in active research.
PEO3	<b>Mechanical Graduates</b> shall have the ability to design products with interdisciplinary skills.
PEO4	Graduates will serve the society with their professional skills

#### PROGRAM SPECIFIC OUTCOMES

**PSO1-** Students acquire necessary technical skills in mechanical engineering that make them employable graduate.

**PSO2-** An ability to impart technological inputs towards development of society by becoming an entrepreneur

#### LIST OF EQUIPMENTS

1. Lagged Pipe Apparatus
2. Critical heat flux apparatus
3. Natural convection apparatus
4. Transient heat conduction apparatus
5. Emissivity apparatus
6. Pin-Fin apparatus
7. Film and drop wise condensation apparatus
8. Composite wall apparatus
9. Concentric sphere apparatus
10. Heat Pipe apparatus
11. Thermal conductivity of given metal rod
12. Parallel & Counter flow heat exchanger
13. Forced convection apparatus
14. Stefan boltzman apparatus



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## **DEPARTMENT OF MECHANICAL ENGINEERING**

### **2060381 HEAT TRANSFER LAB**

#### **Do's**

- Enter laboratory with appropriate laboratory uniform and shoes.
- Keep all your belongings in the book rack or at the place suggested by lab instructor.
- Bring the laboratory manual, observation and record without fail.
- Collect the instruments and check for damage if any before carrying out the experiment.
- Eliminate potentially dangerous chemical reactions by thoroughly washing beakers, test tubes, flasks
- and other glassware before and after use. Always add concentrated chemical (e.g. acid or base) to water NOT water to concentrated chemical.
- Make sure that all equipment is clean and returned to its original place after performing experiments.
- Turn off all heating apparatus, gas valves, and water faucets when not in use.
- Wear disposable gloves, as provided in the laboratory, when handling hazardous materials.
- Remove the gloves before exiting the laboratory.

#### **Don'ts**

- Don't place glassware near edge of laboratory bench.
- Don't let water drip onto power strips.
- Never point the open end of a test tube containing a substance at yourself or others.
- Don't use mobile phones during laboratory hours.
- Don't fool around in the laboratory.
- Don't come with long hair, dangling jewelry and loose or baggy clothing which are a hazard in the laboratory.