Course No.: CMP 322
Course Title: Heat Transfer Laboratory
Course Type: Core
Course Credits: 1

Course description: Lab experiments on various types of equipment related to heat transfer.

Pre-requisites: CML 222 Heat Transfer

Textbooks:


Objectives:

1. To give the in-hand experience of lab-scale experiments on various types of equipments such as heat transfer through forced convection, pin fin, lagged pipe, emissivity apparatus, Stefan’s boltzmann apparatus, shell and tube heat exchanger, double pipe heat exchanger, open pan evaporator, single effect evaporator, heat transfer in agitated vessel system.
2. To observe and note down the steady state temperatures of all equipments.
3. To determine the heat transfer rate, heat transfer coefficient, and overall heat transfer coefficient for various equipments such as shell and tube heat exchanger, double pipe heat exchanger etc.

Outcomes:

Students will gain practical knowledge of experimental methods. It is expected that students will be able to plan an appropriate approach to experiment work, adapt original plans in the
light of preliminary findings, demonstrate safe working in the choice of method and apparatus, handle apparatus and substances correctly and safely, make measurements to an appropriate degree of accuracy and precision, collect information to arrive at a final conclusion, appraise critically the experimental work, including identification of, and accounting for, anomalous results and experimental error, and suggest related improvements to methods, to write up an appropriate concise report.

**Expanded Course description:**

1. To find surface heat transfer coefficient for a pipe flowing heat by forced Convection of air flowing through it for different air flow rate and heat flow rate.
2. To study the temperature distribution along the length of a pin fin under free and forced convection heat transfer.
3. To determine heat flow rates through the lagged pipe for the known value of thermal conductivity of lagged material and To plot the temperature distribution across the lagged material.
4. To determine the emissivity of the grey surface.
5. To find out Stefan’s Boltzmann constant.
6. To determine the cold water side and hot water side heat transfer coefficient, LMTD and overall heat transfer coefficient for parallel and counter flow.
7. To calculate the rate of heat transfer, LMTD and overall heat transfer coefficient for parallel and counter flow.
8. To determine the evaporation coefficient and overall heat transfer coefficient of the open pan.
9. To determine the overall heat transfer coefficient of the evaporator.10. To determine the heat transfer coefficient in the agitated vessel system.

**Total Experiments to be conducted:** Eight

**Class Schedule:** Two hours per week.