

HEAT AND MASS TRANSFER LAB (ME-321 L)

Pre-requisite: None

Credit Hours: 01

Contact Hours: 48

RECOMMENDED BOOK(S)

Heat and Mass Transfer Lab Manual

REFERENCE BOOK(S)

Heat Transfer, a Practical Approach By Y. A. Cengel, McGraw-Hill

COURSE OBJECTIVES

The course covers the Basic and advance Heat and Mass Transfer using experimental approach to understand the Fourier law for conduction and convection. The course also covers the experimental determination of the log mean temperature difference for different types of heat exchanges.

S. No.	CLO/PLOS MAPPING	DOMAIN	PLO
1	Operate multiple Heat Transfer testing units to determine heat conduction properties of materials and observe heat transfer phenomenon.	P3	04
2	Manipulate different settings and parameters of Heat Transfer units and their Control systems to investigate the effect of changing materials and temperatures on heat transfer.	P3	04

COURSE CONTENTS

Fourier's law study for linear conduction of heat along a homogenous bar

Conduction of heat and overall heat transfer along a composite bar

The effect of a change in cross sectional area on the temperature profile along a thermal conduct

Temperature distribution for steady state conduction of heat through the wall of a thick disk

Fourier's rate equation in determining the rate of heat flow through wall of a thick disk

Determination of the relationship between power input and surface temperature in free convection for flat type heat exchanger

Determination of the relationship between Input velocity and surface temperature in force convection for flat type heat exchanger

Determination of the relationship between power input and surface temperature in free convection for pinned heat sink type heat exchanger

Determination of the relationship between Input velocity and surface temperature in force convection for pinned heat sink heat exchanger

Determination of the relationship between power input and surface temperature in free convection for fin type heat exchanger

Determination of the relationship between Input velocity and surface temperature in force convection for fin type heat exchanger

Determination of logarithmic average of the temperature difference for double pipe type heat exchanger for parallel flow

Determination of logarithmic average of the temperature difference for double pipe type heat exchanger for counter flow

Determination of logarithmic average of the temperature difference for flat plate type heat exchanger for parallel flow

Determination of logarithmic average of the temperature difference for flat plate type heat exchanger for counter flow

Determination of logarithmic average of the temperature difference for shell and tube type heat exchanger for parallel flow

Determination of logarithmic average of the temperature difference for shell and tube type heat exchanger for counter flow

Determination of thermal conductivity of liquids and Gases