



Heat transfer is defined as energy-in-transit due to temperature difference.

Heat transfer takes place whenever there is a temperature gradient within a system or whenever two systems at different temperatures are brought into thermal contact.

Heat, which is energy-in-transit, cannot be measured or observed directly, but the effects produced by it can be observed and measured.

Since heat transfer involves transfer and/or conversion of energy, all heat transfer processes must obey the first and second laws of thermodynamics. However unlike thermodynamics, heat transfer deals with systems not in thermal equilibrium and using the heat transfer laws it is possible to find the rate at which energy is transferred due to heat transfer.

From the engineer's point of view, estimating the rate of heat transfer is a key requirement. Refrigeration and air conditioning involves heat transfer, hence a good understanding of the fundamentals of heat transfer is a must for a student of refrigeration and air conditioning.

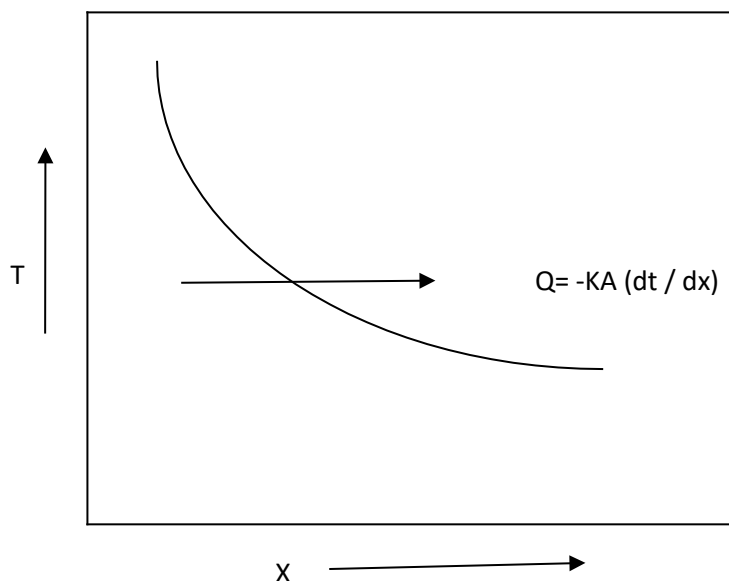
This section deals with a brief review of heat transfer relevant to refrigeration and air conditioning. Generally heat transfer takes place in three different modes: conduction, convection and radiation.

In most of the engineering problems heat transfer takes place by more than one mode simultaneously, i.e., these heat transfer problems are of multi-mode type.

Conduction heat transfer, Radiation heat transfer, Convection Heat Transfer

Here the Temperature difference is the driving potential

Q depends on ΔT , Thermal resistance





DEPARTMENT OF MECHANICAL ENGINEERING, 19MEB302/ Heat and Mass Transfer –

UNIT V - MASS TRANSFER

Topic - Heat Transfer Analogy

References:

References:

1. Kothandaraman C.P “Fundamentals of Heat and Mass Transfer” New Age International, New Delhi, 4th Edition 2012 (Unit I, II, III, IV, V).
2. Frank P. Incropera and David P. DeWitt, “Fundamentals of Heat and Mass Transfer”, John Wiley and Sons, New Jersey, 6th Edition 1998 (Unit I, II, III, IV, V)
3. MIT open courseware – <https://ocw.mit.edu/courses/mechanical-engineering>
4. Other web sources