

CH301 HEAT TRANSFER OPERATIONS

Credits: 5 (L = 4, P = 2)

(Pre-requisite: None)

Course Details:

Fundamentals of heat transfer:

Steady and unsteady state conductions in one and two dimensions

Convection:

Natural and Force Convection, Laminar and Turbulent flow heat transfer without phase change. Overall heat transfer Coefficient. Heat Transfer in Coils, Jackets & agitated vessels. Simple analogies, Heat transfer in fixed and fluidized beds.

Detail 3:

Heat Transfer with phase change - boiling and Condensation, Heat Transfer to molten metals.

Detail 4:

Heat Transfer by radiation, emissivity, absorptivity, black & gray bodies. View factors.

Detail 5:

Heat Transfer with combined mechanism.

Design principles & specifications of heat exchangers:

Design Standards. Double Pipe, Shell & Tube heat exchangers, finned tube heat exchangers, Fabrication techniques of heat exchangers, Boilers & Condenser.

Furnaces & fixed heaters:

Basic Constructions, Design, heat transfer, stack design, thermal efficiency

Detail 8:

Evaporation & Evaporator design, single & multiple effect evaporation.

Detail 9:

Principles & Practicals aspects of industrial insulation.

Reference Books:

Process Heat Transfer:

Tata Mc Graw Hill

D.Q.Kern

Tata Mc Graw Hill

Heat Transmission

R H Mcadams:

Chemical Engineering Vol - 1:

Asian Books Pvt. Ltd.

Coulson & Richardson