

ME-701 Elective –I (ME-701 (A) – Design of Heat Exchangers)

UNIT 1: Introduction: Types of heat exchangers heat transfer laws applied to heat exchangers convection Coefficients, resistance caused by the walls and by fouling, overall heat transfer coefficient.

Unit 2: Thermal & hydraulic design of commonly used heat exchangers : LMTD & NTU Methods, correction factors, Double pipe heat exchangers , shell and tube heat exchangers, condensers , Evaporators ,Cooling and dehumidifying coils ,cooling towers, evaporative condensers , design of air washers, desert coolers.

Unit 3: TEMA standard: Tubular heat exchangers TEMA standard heat-exchanger- nomenclature, selection criteria for different types of shells and front and rear head ends; geometrical characteristics of TEMA heat exchangers.

Unit 4: Review of mechanical Design, Materials of Construction, corrosion damage, testing and inspection.

Unit 5: Heat Pipe: Basics & its mathematical model, micro Heat Exchangers0, Use of Software in heat exchanger design.

References:

1. Kern D Q, Kraus A D; Extended Surface Heat Transfer; TMH.
2. Kays, Compact Heat Exchangers and London, TMH.
3. Kokac, Heat Exchangers- Thermal Hydraulic fundamentals and design;TMH.
4. Tubular Exchanger Manufacturer Association (TEMA), and other codes