

ME 687 Heat Exchanger Design (3-0-0-6)

Introduction: Types, Classification of heat exchangers; Basic design methods for Recuperators and Regenerators: LMTD, effectiveness-NTU method; Forced convection correlations, pressure drop, fouling in heat exchangers; Double pipe heat exchangers: Thermal and Hydraulic design; Fundamentals of two phase heat transfer; Shell and Tube Heat exchangers: Basic design procedure, Kern method, Bell-Delaware method, stream analysis method; Heat exchanger Network (HEN) and process integration; Pinch design method; Design of Boilers, Condensers; Compact Heat Exchangers; Process Fired heaters and furnaces; Thermodynamics of heat exchangers: Principles of Exergy analysis.

Textbooks:

- [1] G. F. Hewitt, G L Shires and T R Bott, Process Heat Transfer, CRC Press, 1994.
- [2] A. Kakac, H Liu, Heat Exchangers, CRC Press, 2002.

References:

- [1] Yonous A. Cengel, Heat transfer: A Practical Approach, McGraw Hill, 2002.
- [2] Thomas Lestina and Robert Serth, Process Heat Transfer, Principles and Applications, Academic Press, 2007.
- [3] R. K. Shah and D P Sekulic, Fundamentals of Heat Exchanger Design, John Wiley & Sons., 2003.
- [4] Tubular Exchanger Manufacturers Association, Inc, Standards of Tubular Exchanger Manufacturers Association, 1968.
- [5] Sarit K. Das, Process Heat Transfer, Narosa Publishing House, 2005.
- [6] W. M. Kays, A. L. London, Compact Heat Exchangers, Krieger Pub Co, 1998