UCH834 PROCESS INTEGRATION

L	T	P	Cr
3	1	0	3.5

Course Objectives:
To understand the energy and mass targets in design of processes.

Introduction: Process integration, Role of thermodynamics in process design, Concept of pinch technology and its application.

Heat exchanger networks: Heat exchanger networks analysis**,** Simple design for maximum energy recovery, Loop Breaking & Path Relaxation, Targeting of energy, area, number of units and cost, Trading off energy against capital.

Network Integration: Super targeting, maximum energy recovery (MER), Network for multiple utilities and multiple pinches, Grand Composite curve (GCC).

Mass integration: Distillation sequences.

Heat and Power Integration: Columns, Evaporators, Dryers, and reactors.

Case studies: Waste and waste water minimization, Flue gas emission targeting.

Course Learning Outcomes (CLO):

Upon completion of this course, the students will be able to:

1. understand of the fundamentals of process integration.
2. perform pinch analysis.
3. analyze and design heat exchanger networks.
4. minimize the water consumption and waste generation.

Text Books:

1. *Linnhoff, D.W., User Guide on Process Integration for the Efficient Use of Energy, Institution of Chemical Engineers (1994).*
2. *Smith, R., Chemical Process Design and Integration, John Wiley & Sons(2005).*

Reference Books:

1. *Shenoy, V. U., Heat Exchanger network synthesis, Gulf Publishing (1995).*
2. *Kumar, A., Chemical Process Synthesis and Engineering Design, Tata McGraw Hill (1977).*

Evaluation Scheme:

S. No.	Evaluation Elements	Weightage (%)
1	MST	30
2	EST	45
3	Sessional (May includes tutorials/ assignments/ quiz's etc)	25

Revised scheme approved by the 90th meeting of the senate (May 30, 2016)