PCH214 PROCESS INTEGRATION

L	T	P	Cr
3	1	0	3.5

Course Objective:
To learn process integration with regard to energy efficiency, waste minimization and an efficient use of raw materials.

Introduction: Process integration, Role of thermodynamics in process design.

Network Integration: Targeting of energy, area, number of units and cost, Super targeting, Concept of pinch technology and its application, Heat exchanger networks analysis, Maximum energy recovery (MER), Networks for multiple utilities and multiple pinches.

Heat and Power Integration: Heat integration: Design columns, evaporators, dryers, and reactors, Minimization of raw water utilization and waste water generation, Flue gas emission targeting, Case studies, Concept of process integration for recycling and reuse, Mathematical approach for process integration, Case studies.

Course learning outcomes (CLOs):

The students will be able to

1. carry out pinch analysis.
2. analyze heat exchanger networks, and networks for multiple utilities
3. solve problems of heat and power integration
4. modify processes for minimization of wastewater and raw water utilization

Recommended 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, Mc-Graw Hill (1995).*
3. *Shenoy, V.U., Heat Exchanger Network Synthesis, Gulf Publishing (1995).*
4. *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 include Assignments/Projects/Tutorials/Quizes/Lab Evaluations)	25