

# GUJARAT TECHNOLOGICAL UNIVERSITY

## Chemical Engineering

M.E. Semester: II

Subject Name: **Advance Computer Aided Design**

Sr. No.	Course Content
1.	<b>Synthesis of Heat Exchanger Networks:</b> Introduction, basic heat exchanger network synthesis(HENS), Hohmann / Lochart Composite Curves, Grand Composite Curve(GCC), pinch design approach to inventing a network, Picking the right minimum temperature driving force $T_{MIN}$ , Minimum utility cost, maximum energy recovery, minimum number of exchanger, threshold and optimum approach temperature, derivation of network structures for minimization of annual costs, , Multiple utility design problems.
2.	<b>Optimization and Heat Integration:</b> Sequential and Simultaneous approaches of Optimization and Integration, Simultaneous MINLP model for optimization, Application, Problems and Examples – Crude Heat Pre-train, Aromatics Plants, Evaporator / Dryer Plant.
3.	<b>Energy Integrated Distillation Processes:</b> Heat flows in distillation, T-Q Diagram, Interheating / Intercooling, Thermal condition of feed, Heat flows in side strippers and side enriches Heat integrated distillation trains, impact of pressure, multi effect distillation, Heat Pumping Vapour Recompression and Reboiler Flashing, Heat engine and Heat Pumps optimization. , Separation of Azeotropic Mixtures
4.	<b>Mass Integration:</b> Introduction, minimum Mass Separating Agent (MSA), mass exchanger networks minimum external MSA, minimum number of mass exchangers.
5.	Design & Scheduling of Batch Processing

### Text Books:

1. Systematic Methods of Chemical Process Design, Lorens T. Biegler , E.Ignacio grossmann, Arthur W Westerberg , Published by-Prentice Hall International,Inc

### Reference Books:

1. Product and Process Design Principles ,Warren D Seider, J. D. Seader, Daniel R Lewin Published by John Wiley and Sons,Inc.
2. User Guide on Process Integration for the efficient use of energy B Linnhoff IChE (UK)