

PRPE3002 ADVANCED SEPARATION TECHNOLOGY (3-0-0)

Course Objective:

To understand the governing mechanisms and driving forces of various advanced separation processes and to equip process and design parameters for advanced separation processes.

Module-I: (12 hr)

Rate governed processes, definitions and terminologies. Membranes: Types and modules, classification of membrane processes, membranematerials, advantages and disadvantages of membrane processes, major areas of application, preparation and characterization of membranes.

Module-II: (08 hr)

Principles, advantages, disadvantages, and applications of reverse osmosis, nano- filtration, ultra-filtration, and micro-filtration.

Module-III: (10 hr)

Principles, advantages, disadvantages, and applications of dialysis, gas separation, pervaporation, electrodialysis, and liquid membranes.

Module-IV: (06 hr)

Facilitated transport, recent advances in membrane processes, and biomedical applications of membranes.

Course Outcomes:

After completion of this course, student will be able to:

- CO1: Apply modern separation techniques in various applications
- CO2: Analyse and evaluate novel membranes for intended application
- CO3: Analyse and design pervaporation, chromatography and dialysis based separation processes
- CO4: Utilize the technological methods in problem solving in process plant.

Text Book:

1. Membrane Separation Processes by K Nath, PHI.

Reference Books:

1. Perry's Chemical Engineers' Handbook, 8th ed. by D W Green and R H Perry, McGraw-Hill.
2. Separation Processes, 2nd ed. by C J King, Dover Publications.
3. Handbook of Separation Process by R W Rousseau, Wiley.
4. Principles of Mass Transfer and Separation Processes by B K Dutta, PHI.
5. Transport Processes and Separation Process Principles, 4th ed. by C J Geankoplis, Pearson.
6. Separation Process Principles, 2nd ed. by J D Seader and E J Henley, Wiley.