# Novel Separation Processes - Video course

## COURSE OUTLINE

Fundamentals of Separation Processes; Basic definitions of relevant terms.

Membrane based separation processes; fundamentals and various terms; classifications; Design aspects: various models and their applicabilities.

External field induced membrane separation processes for colloidal particles; fundamentals of various colloid separation; derivation of profile of electric field strength; coupling with membrane separation and electrophoresis.

Gas separation; Surfactant based separation processes.

Liquid membranes:

1. Fundamentals and modeling.
2. Micellar enhanced separation processes.
3. Cloud point extraction;Centrifugal Separation processes and their calculations.
4. Ion exchange and chromatographic separation processes.
5. Supercritical fluid extraction.

## COURSE DETAIL

| S.No | Topics | No. of Hours |
|---|---|---|
| 1 | Fundamentals of Separation Processes. | 1 |
| 2 | Basic definitions of relevant terms. | 1 |
| 3 | Membrane based separation processes:<br>1. Fundamentals and various terms.<br>2. Classifications.<br>3. Design aspects: various models and their applicabilities. | 20 |
| 4 | External field induced membrane separation processes for colloidal particles:<br>1. Fundamentals of various colloid separation.<br>2. Derivation of profile of electric field strength.<br>3. Coupling with membrane separation and electrophoresis. | 6 |

NP-TEL

NPTEL

**http://nptel.iitm.ac.in**

Chemical Engineering

**Pre-requisites:**

CH 20001 (Fluid Flow).

**Hyperlinks:**

1. www.ees.elsevier/seppur
2. www.ees.elsevier/memsci

**Coordinators:**

**Prof. S. De**
Department of Chemical EngineeringIIT Kharagpur

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|---|---|---|
| 5 | Gas separation. | 2 |
| 6 | Surfactant based separation processes:<br>1. Liquid membranes: fundamentals and modeling.<br>2. Micellar enhanced separation processes.<br>3. Cloud point extraction. | 4 |
| 7 | Centrifugal Separation processes and their calculations. | 2 |
| 8 | Ion exchange and chromatographic separation processes. | 2 |
| 9 | Supercritical fluid extraction. | 2 |
| | **Total** | 40 |

**References:**


1. Handbook of Separation Process Technology by R W Rousseau (John Wiley & Sons).
2. Supercritical Fluid Extraction by M A Mchugh & V J Krukonis (Butterworth Heinmann).
3. Large Scale Adsorption & Chromatography by W C Wankat (CRC Press Inc).
4. Advanced Membrane Technology and Applications by N N Li (Wiley).