

## UCH714 MEMBRANE SEPARATION PROCESSES

<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
<b>3</b>	<b>1</b>	<b>0</b>	<b>3.5</b>

**Course Objectives:** To be able to understand the preparation and characterization of membranes for different applications.

**Overview of membrane science and technology:** Classification of membrane and membrane based processes, Advantages of membrane processes, Membrane materials

**Preparation and characterization of membranes:** Fundamental theory and application of membrane processes, Membrane modules, General method of membrane manufacture.

**Different membrane processes:** Reverse osmosis, Microfiltration, Ultra-filtration, Nano-filtration, Electro-dialysis, Dialysis, Per-evaporation, Gas separation, Membrane distillation, Liquid membrane technology, Transport through membrane, Membrane reactor, Membrane chromatography.

**Application of membranes:** Application of membranes in bio-separation, Bio-catalytic membrane reactors, Biomedical application of membranes.

### Course Learning Outcomes (CLO):

The students will be able to:

1. understand the principles and materials properties for different membrane separation processes
2. Identify the best membrane modules and manufacturing process for different applications
3. identify and design the suitable membrane separation technique for intended problem

### Text Books:

1. *R.W. Baker, Membrane Technology and Application, John Wiley and Sons Ltd. (2004).*
2. *Hoffman, E.J., Membrane Separation Technology: Single stage, Multistage and Differential Permeation, (2009).*

### Reference Books:

1. *Porter, M.C., Handbook of Industrial Membrane Technology, Crest Publishing House (2005).*

### Evaluation Scheme:

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