

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Chemical Engineering - NOC:Membrane Technology

Subject Co-ordinator - Prof. Kaustubha Mohanty

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Separation Processes, Historical Development, Definition and Types of Membranes  
Lecture 2 - Membrane Processes and Classifications, Advantages, Disadvantages, Applications  
Lecture 3 - Polymer Basics, Polymers used in Membrane Preparation and their Properties  
Lecture 4 - Inorganic Materials for Membrane Preparation, their Advantages and Disadvantages  
Lecture 5 - Membrane Modules and Selection, Flow Types  
Lecture 6 - Preparation of Synthetic Membrane, Phase Inversion Membranes  
Lecture 7 - Composite membranes  
Lecture 8 - Inorganic membranes  
Lecture 9 - Porous and non-porous membranes, characterization of porous membranes and MF membrane  
Lecture 10 - MF membrane characterization  
Lecture 11 - UF membrane characterization  
Lecture 12 - Passive transport, active transport, description of transport process  
Lecture 13 - Transport through porous membrane and nonporous membrane  
Lecture 14 - Concept of osmosis and reverse osmosis, thermodynamic analysis  
Lecture 15 - Revision of concepts and fundamentals  
Lecture 16 - HP and LP RO, membrane materials, modules, models for RO transport  
Lecture 17 - Advantages of RO, fouling, RO applications, Pressure retarded osmosis  
Lecture 18 - Nanofiltration basics, transport mechanism, fouling model and applications  
Lecture 19 - Basic principles of UF, membranes and modules, UF configurations  
Lecture 20 - Models for UF transport, mass transfer coefficient, membrane rejection and sieving coefficient  
Lecture 21 - Factors affecting UF performance, fouling and permeate flux enhancement, UF applications1  
Lecture 22 - Micellar-enhanced UF, affinity UF, UF based bioseparation  
Lecture 23 - Basic principles, advantages of MF, cross-flow and dead-end MF, membranes and modules  
Lecture 24 - Models for MF transport, plugging and throughput, fouling in MF, MF applications  
Lecture 25 - Problems and solutions based on RO and MF  
Lecture 26 - Problems and solutions based on UF  
Lecture 27 - Dialysis, membranes and modules, mass transport in dialysis, diffusion analysis, applications  
Lecture 28 - Ion-exchange membranes, ED process, energy requirement, applications, reverse ED  
Lecture 29 - PV principle, advantages, mass transfer and applications, hybrid distillation/PV

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- Lecture 30 - Problems and solutions based on ED and PV
- Lecture 31 - Concept, types of LM, mechanism of mass transfer in LM, choice of solvent and carrier, applications
- Lecture 32 - Basic principle of gas separation, transport mechanism, factors affecting gas separation, applications
- Lecture 33 - Basic principle of MD, mechanism, process parameters, membranes, applications
- Lecture 34 - Mechanism, coupled transport, carrier agent, active and passive transport, applications
- Lecture 35 - Gas-liquid and liquid-liquid contactors, membrane reactors and bioreactors, PEM hydrogen fuel cell
- Lecture 36 - Perstraction, membrane chromatography and controlled drug delivery