

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

NPTEL Video Course - Chemical Engineering - Advanced Chemical Reaction Engineering (PG)

Subject Co-ordinator - Prof. H.S. Shankar

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Course Overview - I
Lecture 2 - Course Overview - II
Lecture 3 - Design Equations - I
Lecture 4 - Design Equations - Illustrative Examples
Lecture 5 - Design Equations - II
Lecture 6 - Illustrative Examples
Lecture 7 - Illustrative Examples
Lecture 8 - Multiple Reactions - II
Lecture 9 - Modelling Multiple Reactions in Soil Environment - III
Lecture 10 - Semi Continuous Reactor Operation
Lecture 11 - Catalyst Deactivation - I
Lecture 12 - Catalyst Deactivation - II
Lecture 13 - Illustrative Example
Lecture 14 - Energy Balance - I
Lecture 15 - Energy Balance - II
Lecture 16 - Reacting Fluids as Energy Carrier
Lecture 17 - Illustrative Example
Lecture 18 - Energy Balance - III
Lecture 19 - Energy Balance - IV
Lecture 20 - Energy Balance - V
Lecture 21 - Illustrative Example
Lecture 22 - Energy Balance - VI
Lecture 23 - Illustrative Example
Lecture 24 - Illustrative Example
Lecture 25 - Illustrative Example
Lecture 26 - Residence Time Distribution Methods
Lecture 27 - Residence Time Distribution Models
Lecture 28 - Shrinking core Gas-Solid reactions Model
Lecture 29 - Shrinking core Ash Diffusion Model & Combination of Resistances

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- Lecture 30 - 1) Gas Solid Reactions Temperature Effects on Rate & Equilibria 2) Introduction to Population Balance
- Lecture 31 - Illustrative Example
- Lecture 32 - Population Balance Modelling - II
- Lecture 33 - Population Balance Modelling - III
- Lecture 34 - Illustrative Examples
- Lecture 35 - Introduction to Environmental Reactions
- Lecture 36 - Reaction Engineering Examples in Biochemical & Environmental Engineering
- Lecture 37 - Illustrative Examples
- Lecture 38 - Illustrative Examples
- Lecture 39 - Oxygen Sag Analysis in Rivers
- Lecture 40 - Illustrative Examples
- Lecture 41 - Illustrative Example

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

NPTEL Video Course - Chemical Engineering - Advanced Process Control

Subject Co-ordinator - Prof. Sachin C. Patwardhan

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction and Motivation

Lecture 2 - Linearization of Mechanistic Models

Lecture 3 - Linearization of Mechanistic Models (Continued...)

Lecture 4 - Introduction to z-transforms and Development of Grey-box models

Lecture 5 - Introduction to Stability Analysis and Development of Output Error Models

Lecture 6 - Introduction to Stochastic Processes

Lecture 7 - Introduction to Stochastic Processes (Continued...)

Lecture 8 - Development of ARX models

Lecture 9 - Statistical Properties of ARX models and Development of ARMAX models

Lecture 10 - Development of ARMAX models (Continued...) and Issues in Model Development

Lecture 11 - Model Structure Selection and Issues in Model Development (Continued...)

Lecture 12 - Issues in Model Development (Continued...) and State Realizations of Transfer Function Models

Lecture 13 - Stability Analysis of Discrete Time Systems

Lecture 14 - Lyapunov Functions and Interaction Analysis and Multi-loop Control

Lecture 15 - Interaction Analysis and Multi-loop Control (Continued...)

Lecture 16 - Multivariable Decoupling Control and Soft Sensing and State Estimation

Lecture 17 - Development of Luenberger Observer

Lecture 18 - Development of Luenberger Observer (Continued...) and Introduction to Kalman Filtering

Lecture 19 - Kalman Filtering

Lecture 20 - Kalman Filtering (Continued...)

Lecture 21 - Kalman Filtering (Continued...)

Lecture 22 - Pole Placement State Feedback Control Design and Introduction to Linear Quadratic Gaussian (LQG)

Lecture 23 - Linear Quadratic Gaussian (LQG) Regulator Design

Lecture 24 - Linear Quadratic Gaussian (LQG) Controller Design

Lecture 25 - Model Predictive Control (MPC)

Lecture 26 - Model Predictive Control (Continued...)

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

NPTEL Video Course - Chemical Engineering - Chemical Reaction Engineering II

Subject Co-ordinator - Prof. A.K. Suresh, Prof. Ganesh A. Viswanathan, Prof. Sanjay M. Mahajani

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction to catalysts and catalysis
- Lecture 2 - Steps in catalytic reaction
- Lecture 3 - Derivation of the rate equation
- Lecture 4 - Heterogenous data analysis for reactor design - I
- Lecture 5 - Heterogenous data analysis for reactor design - II
- Lecture 6 - Catalyst deactivation and accounting for it in design - I
- Lecture 7 - Catalyst deactivation and accounting for it in design - II
- Lecture 8 - Synthesize the rate equation
- Lecture 9 - Introduction to intraparticle diffusion
- Lecture 10 - Intraparticle diffusion
- Lecture 11 - Intraparticle diffusion
- Lecture 12 - Intraparticle diffusion
- Lecture 13 - Effectiveness factor and Introduction to external mass transfer
- Lecture 14 - External Mass Transfer
- Lecture 15 - Implications to rate data interpretation and design - I
- Lecture 16 - Implications to rate data interpretation and design - II
- Lecture 17 - Packed-bed reactor design
- Lecture 18 - Fluidized bed reactor design - I
- Lecture 19 - Fluidized bed reactor design - II
- Lecture 20 - Gas-liquid reactions-1
- Lecture 21 - GLR-2
- Lecture 22 - GLR-3
- Lecture 23 - GLR-4
- Lecture 24 - GLR-5
- Lecture 25 - GLR-6
- Lecture 26 - GLR-7
- Lecture 27 - Fluid-solid non-catalytic reactions - I
- Lecture 28 - Fluid-solid non-catalytic reactions - II
- Lecture 29 - Fluid-solid non-catalytic reactions - III

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- Lecture 30 - Distribution of residence time
- Lecture 31 - Measurement of residence time distribution
- Lecture 32 - Residence time distribution function
- Lecture 33 - Reactor diagnostics and troubleshooting
- Lecture 34 - Modeling non-ideal reactors
- Lecture 35 - Residence time distribution
- Lecture 36 - Non-ideal Reactors
- Lecture 37 - Non-ideal Reactors
- Lecture 38 - Non-ideal Reactors
- Lecture 39 - Non-ideal Reactors

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

NPTEL Video Course - Chemical Engineering - Advanced Numerical Analysis

Subject Co-ordinator - Prof. Sachin C. Patwardhan

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction and Overview

Lecture 2 - Fundamentals of Vector Spaces

Lecture 3 - Basic Dimension and Sub-space of a Vector Space

Lecture 4 - Introduction to Normed Vector Spaces

Lecture 5 - Examples of Norms, Cauchy Sequence and Convergence, Introduction to Banach Spaces

Lecture 6 - Introduction to Inner Product Spaces

Lecture 7 - Cauchy Schwarz Inequality and Orthogonal Sets

Lecture 8 - Gram-Schmidt Process and Generation of Orthogonal Sets

Lecture 9 - Problem Discretization Using Approximation Theory

Lecture 10 - Weierstrass Theorem and Polynomial Approximation

Lecture 11 - Taylor Series Approximation and Newton's Method

Lecture 12 - Solving ODE - BVPs Using Finite Difference Method

Lecture 13 - Solving ODE - BVPs and PDEs Using Finite Difference Method

Lecture 14 - Finite Difference Method (Continued...) and Polynomial Interpolations

Lecture 15 - Polynomial and Function Interpolations, Orthogonal Collocations Method for Solving ODE -BVPs

Lecture 16 - Orthogonal Collocations Method for Solving ODE - BVPs and PDEs

Lecture 17 - Least Square Approximations, Necessary and Sufficient Conditions for Unconstrained Optimization

Lecture 18 - Least Square Approximations -Necessary and Sufficient Conditions for Unconstrained Optimization

Lecture 19 - Linear Least Square Estimation and Geometric Interpretation of the Least Square Solution

Lecture 20 - Geometric Interpretation of the Least Square Solution (Continued...) and Projection Theorem in a

Lecture 21 - Projection Theorem in a Hilbert Spaces (Continued...) and Approximation Using Orthogonal Basis

Lecture 22 - Discretization of ODE-BVP using Least Square Approximation

Lecture 23 - Discretization of ODE-BVP using Least Square Approximation and Galerkin Method

Lecture 24 - Model Parameter Estimation using Gauss-Newton Method

Lecture 25 - Solving Linear Algebraic Equations and Methods of Sparse Linear Systems

Lecture 26 - Methods of Sparse Linear Systems (Continued...) and Iterative Methods for Solving Linear Algebraic

Lecture 27 - Iterative Methods for Solving Linear Algebraic Equations

Lecture 28 - Iterative Methods for Solving Linear Algebraic Equations

Lecture 29 - Iterative Methods for Solving Linear Algebraic Equations

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- Lecture 30 - Iterative Methods for Solving Linear Algebraic Equations
- Lecture 31 - Iterative Methods for Solving Linear Algebraic Equations
- Lecture 32 - Optimization Based Methods for Solving Linear Algebraic Equations
- Lecture 33 - Conjugate Gradient Method, Matrix Conditioning and Solutions of Linear Algebraic Equations
- Lecture 34 - Matrix Conditioning and Solutions and Linear Algebraic Equations (Continued...)
- Lecture 35 - Matrix Conditioning (Continued...) and Solving Nonlinear Algebraic Equations
- Lecture 36 - Solving Nonlinear Algebraic Equations
- Lecture 37 - Solving Nonlinear Algebraic Equations
- Lecture 38 - Solving Nonlinear Algebraic Equations
- Lecture 39 - Solving Nonlinear Algebraic Equations
- Lecture 40 - Solving Ordinary Differential Equations - Initial Value Problems (ODE-IVPs)
- Lecture 41 - Solving Ordinary Differential Equations - Initial Value Problems (ODE-IVPs)
- Lecture 42 - Solving ODE-IVPs
- Lecture 43 - Solving ODE-IVPs
- Lecture 44 - Solving ODE-IVPs
- Lecture 45 - Solving ODE-IVPs
- Lecture 46 - Solving ODE-IVPs
- Lecture 47 - Solving ODE-IVPs
- Lecture 48 - Methods for Solving System of Differential Algebraic Equations
- Lecture 49 - Methods for Solving System of Differential Algebraic Equations (Continued...) and Concluding Remarks

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

NPTEL Video Course - Chemical Engineering - NOC:Introduction to Evolutionary Dynamics

Subject Co-ordinator - Prof. Supreet Saini

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - History of the theory of Natural Selection - 1
- Lecture 2 - History of the theory of Natural Selection - 2
- Lecture 3 - Exponential growth models
- Lecture 4 - Logistic Growth Models - 1
- Lecture 5 - Logistic Growth Models - 2
- Lecture 6 - Modelling selection - 1
- Lecture 7 - Modelling Selection - 2
- Lecture 8 - Modelling Selection - 3
- Lecture 9 - Modelling Mutations - 1
- Lecture 10 - Modelling Mutations - 2
- Lecture 11 - Modelling Mutations - 3
- Lecture 12 - Genetic Code and Sequence Spaces
- Lecture 13 - Sequence Spaces as Networks
- Lecture 14 - Sequence Space to Fitness Landscape
- Lecture 15 - Properties of Fitness Landscapes and Quasi-species
- Lecture 16 - Integrating Reproduction, Selection and Mutation
- Lecture 17 - Obtaining Fitness Landscapes Experimentally
- Lecture 18 - NK Model of Fitness Landscape
- Lecture 19 - Modelling Evolution on Fitness Landscapes - 1
- Lecture 20 - Modelling Evolution on Fitness Landscapes - 2
- Lecture 21 - Modelling Evolution on Fitness Landscapes - 3
- Lecture 22 - Role of Randomness in Evolution
- Lecture 23 - Genetic Drift in Evolution of Microbial Populations
- Lecture 24 - Dynamics of a Moran Process without Selection
- Lecture 25 - Dynamics of a Moran Process without Selection
- Lecture 26 - Evolution, Selection, and Genetic Drift
- Lecture 27 - Representing Microbial Evolution
- Lecture 28 - Estimating Timescales of Evolution
- Lecture 29 - Estimating the Speed of Microbial Evolution

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- Lecture 30 - Evolutionary Dynamics when Mutations are Rare
- Lecture 31 - Evolutionary Dynamics when Mutations are Rapid - 1
- Lecture 32 - Evolutionary Dynamics when Mutations are Rapid - 2
- Lecture 33 - Evolutionary Dynamics when Mutations are Rapid - 3
- Lecture 34 - Evolutionary Game Theory - 1
- Lecture 35 - Evolutionary Game Theory - 2
- Lecture 36 - Evolutionary Game Theory - 3
- Lecture 37 - Evolutionary Game Theory - 4
- Lecture 38 - Evolutionary Game Theory Applied to Moran Process
- Lecture 39 - Evolutionary Games During Weak Selection
- Lecture 40 - Evolutionary Dynamics of HIV

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

NPTEL Video Course - Chemical Engineering - NOC:Heat Transfer

Subject Co-ordinator - Prof. Ganesh A. Viswanathan

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction
- Lecture 2 - Introduction to Conduction
- Lecture 3 - Energy Balance
- Lecture 4 - 1D Steadystate Conduction - Resistance Concept
- Lecture 5 - Resistances in Composite Wall Case
- Lecture 6 - Resistances in Radial Systems
- Lecture 7 - Heat Generation - I Plane and Cylindrical Wall
- Lecture 8 - Heat Generation - II Problem; Introduction to Extended Surfaces
- Lecture 9 - Extended Surfaces I - General Formulation
- Lecture 10 - Extended Surfaces II - Fixed Cross-section Area
- Lecture 11 - Extended Surfaces III - Varying Cross-section Area
- Lecture 12 - 2D Plane Wall
- Lecture 13 - Transient Analyses I
- Lecture 14 - Transient Analyses II
- Lecture 15 - Transient Analyses
- Lecture 16 - Introduction to Convective Heat Transfer
- Lecture 17 - Heat and Mass Transport Coefficients
- Lecture 18 - Boundary Layer
- Lecture 19 - Laminar and Turbulent Flows; Momentum Balance
- Lecture 20 - Energy and Mass Balances; Boundary Layer Approximations
- Lecture 21 - Order of Magnitude Analysis
- Lecture 22 - Transport Coefficients
- Lecture 23 - Relationship between Momentum, Thermal and Concentration Boundary Layer
- Lecture 24 - Reynolds and Chilton-Colburn Analogies
- Lecture 25 - Forced Convection
- Lecture 26 - Flow Past Flat Plate I - Method of Blasius
- Lecture 27 - Flow Past Flat Plate II - Correlations for Heat and Mass Transport
- Lecture 28 - Flow Past Cylinders
- Lecture 29 - Flow through Pipes - I

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- Lecture 30 - Flow through Pipes - II
- Lecture 31 - Flow through Pipes - III
- Lecture 32 - Flow through Pipes - IV - Mixing-cup Temperature
- Lecture 33 - Flow through Pipes - V - Log mean Temperature Difference
- Lecture 34 - Flow through Pipes - VI - Correlations for Laminar and Turbulent Conditions
- Lecture 35 - Example problems
- Lecture 36 - Introduction to Free/Natural Convection
- Lecture 37 - Heated Plate in a Quiescent Fluid - I
- Lecture 38 - Heated Plate in a Quiescent Fluid - II
- Lecture 39 - Boiling - I
- Lecture 40 - Boiling - II
- Lecture 41 - Condensation - I
- Lecture 42 - Condensation - II
- Lecture 43 - Radiation
- Lecture 44 - Spectral Intensity
- Lecture 45 - Radiation
- Lecture 46 - Properties of a Blackbody
- Lecture 47 - Surface Adsorption
- Lecture 48 - Kirchoff's Law
- Lecture 49 - Radiation Exchange - View Factor
- Lecture 50 - View Factor Examples
- Lecture 51 - View Factor - Inside Sphere Method, Blackbody Radiation Exchange
- Lecture 52 - Diffuse, Gray Surfaces in an Enclosure
- Lecture 53 - Resistances - Oppenheim Matrix Method
- Lecture 54 - Resistances - Examples
- Lecture 55 - More Examples
- Lecture 56 - Introduction and Examples
- Lecture 57 - Parallel Flow Heat Exchangers
- Lecture 58 - LMTD I
- Lecture 59 - Shell and Tube Heat Exchangers
- Lecture 60 - Epsilon-NTU Method

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NPTEL Video Course - Chemical Engineering - NOC:Chemical Reaction Engineering-II

Subject Co-ordinator - Prof. Ganesh Vishwanathan

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction
- Lecture 2 - Introduction to catalysis and catalytic processes
- Lecture 3 - Catalyst properties and classification
- Lecture 4 - Steps in catalysis
- Lecture 5 - Adsorption isotherm
- Lecture 6 - Surface reaction
- Lecture 7 - Rate controlling steps and Rate law
- Lecture 8 - Rate law
- Lecture 9 - Heterogeneous data analysis for reactor design - I
- Lecture 10 - Heterogeneous data analysis for reactor design - II
- Lecture 11 - Design of reactors
- Lecture 12 - Case study
- Lecture 13 - Catalyst deactivation - I
- Lecture 14 - Catalyst deactivation - II
- Lecture 15 - Catalyst deactivation - III
- Lecture 16 - Catalyst deactivation - IV
- Lecture 17 - Diffusional effects
- Lecture 18 - Internal diffusion effects
- Lecture 19 - Non-dimensionalization
- Lecture 20 - Concentration profile
- Lecture 21 - Internal effectiveness factor - I
- Lecture 22 - Internal effectiveness factor - II
- Lecture 23 - Internal effectiveness factor - III
- Lecture 24 - Falsification of kinetics
- Lecture 25 - External mass transport limitations
- Lecture 26 - Estimation of mass transfer coefficient
- Lecture 27 - Mass transfer to a single particle with reaction
- Lecture 28 - Packed-bed reactor design
- Lecture 29 - Mass transfer coefficient in Packed-beds

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- Lecture 30 - Estimation of conversion in Packed-bed reactor
- Lecture 31 - Overall effectiveness factor - I
- Lecture 32 - Overall effectiveness factor - II
- Lecture 33 - Identification of internal diffusion and reaction-limited regimes
- Lecture 34 - Packed-bed reactor design
- Lecture 35 - Generalized criterion for diffusion and reaction-limited conditions
- Lecture 36 - Network of first order reactions
- Lecture 37 - Use of experimental data
- Lecture 38 - Packed-bed reactor design
- Lecture 39 - Fluidized bed reactor design - I
- Lecture 40 - Fluidized bed reactor design - II
- Lecture 41 - Fluidized bed reactor design - III
- Lecture 42 - Fluidized bed reactor design - IV
- Lecture 43 - Fluid-solid noncatalytic reactions - I
- Lecture 44 - Fluid-solid noncatalytic reactions - II
- Lecture 45 - Fluid-solid noncatalytic reactions - III
- Lecture 46 - Fluid-solid noncatalytic reactions - IV
- Lecture 47 - Fluid-solid noncatalytic reactions - V
- Lecture 48 - Fluid-solid noncatalytic reactions - VI
- Lecture 49 - Residence time distribution (RTD)
- Lecture 50 - RTD
- Lecture 51 - Measurement of RTD - I
- Lecture 52 - Measurement of RTD - II
- Lecture 53 - RTD function
- Lecture 54 - Properties of RTD function
- Lecture 55 - Reactor diagnostics and troubleshooting - I
- Lecture 56 - Reactor diagnostics and troubleshooting - II
- Lecture 57 - Modeling nonideal reactors - I
- Lecture 58 - Modeling nonideal reactors - II
- Lecture 59 - Non-ideal reactors
- Lecture 60 - Non-ideal reactors

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

NPTEL Video Course - Chemical Engineering - NOC:Chemical Process Control

Subject Co-ordinator - Prof. Sujit Jogwar

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Motivation for process control
- Lecture 2 - Functions of process control system
- Lecture 3 - Common control strategies
- Lecture 4 - Components of process control system
- Lecture 5 - Introduction to process dynamics
- Lecture 6 - First principle dynamic models
- Lecture 7 - Empirical and gray box models
- Lecture 8 - Degree of freedom analysis
- Lecture 9 - Introduction to first order dynamical systems
- Lecture 10 - Linearization of process dynamics
- Lecture 11 - Response to step input
- Lecture 12 - Response to sinusoidal input
- Lecture 13 - Introduction to second order dynamical systems
- Lecture 14 - Examples of second order dynamical systems
- Lecture 15 - Response to step input
- Lecture 16 - Effect of damping coefficient
- Lecture 17 - Higher order dynamics
- Lecture 18 - Approximation as FOPDT model
- Lecture 19 - Numerator dynamics
- Lecture 20 - Prediction of step response
- Lecture 21 - Block diagram representation
- Lecture 22 - ON-OFF control
- Lecture 23 - Proportional control
- Lecture 24 - Proportional-Integral control
- Lecture 25 - PID control
- Lecture 26 - Limitations of PID controllers
- Lecture 27 - Stability of dynamical processes
- Lecture 28 - Laplace domain analysis - Part I
- Lecture 29 - Laplace domain analysis - Part II

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- Lecture 30 - Frequency response
- Lecture 31 - Frequency domain analysis
- Lecture 32 - Synthesis problem
- Lecture 33 - Selection problem
- Lecture 34 - Criteria-based controller tuning
- Lecture 35 - Heuristics-based controller tuning
- Lecture 36 - Direct synthesis-based controller tuning
- Lecture 37 - Frequency response-based controller tuning
- Lecture 38 - Cascade control
- Lecture 39 - Split range control and override control
- Lecture 40 - Auctioneering, ratio and inferential control
- Lecture 41 - Openloop control and Internal model control
- Lecture 42 - Dynamic Matrix and Model predictive control
- Lecture 43 - Introduction to multivariable control
- Lecture 44 - Input-output pairing
- Lecture 45 - Tuning of multi-loop SISO controller
- Lecture 46 - Introduction to batch process control
- Lecture 47 - Programmable logic control
- Lecture 48 - Batch to batch control

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

NPTEL Video Course - Chemical Engineering - Heterogeneous Catalysis and Catalytic Processes

Subject Co-ordinator - Dr. K.K. Pant

Co-ordinating Institute - IIT - Delhi

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

Lecture 1
Lecture 2
Lecture 3
Lecture 4
Lecture 5
Lecture 6
Lecture 7
Lecture 8
Lecture 9
Lecture 10
Lecture 11
Lecture 12
Lecture 13
Lecture 14
Lecture 15
Lecture 16
Lecture 17
Lecture 18
Lecture 19
Lecture 20
Lecture 21
Lecture 22
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NPTEL Video Course - Chemical Engineering - Mass Transfer Operations I

Subject Co-ordinator - Dr. B. Mandal

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction to Mass Transfer
- Lecture 2 - Molecular Diffusion
- Lecture 3 - Fick's Law of Diffusion
- Lecture 4 - Steady state molecular diffusion in fluids - Part I
- Lecture 5 - Steady state molecular diffusion in fluids - Part II
- Lecture 6 - Diffusion coefficient
- Lecture 7 - Diffusion Coefficient
- Lecture 8 - Multicomponent Diffusion and Diffusivity in Solids
- Lecture 9 - Concept of Mass Transfer Coefficient
- Lecture 10 - Dimensionless Groups and Co-relations for Convective
- Lecture 11 - Mass Transfer co-efficient in Laminar Flow Condition
- Lecture 12 - Boundary Layer Theory and Film Theory in Mass Transfer
- Lecture 13 - Mass Transfer Coefficients in Turbulent Flow
- Lecture 14 - Interphase Mass Transfer and Mass Transfer Theories - Part I
- Lecture 15 - Interphase Mass Transfer and Mass Transfer Theories - Part II
- Lecture 16 - Interphase Mass Transfer and Mass Transfer Theories - Part III
- Lecture 17 - Agitated and Sparged Vessels
- Lecture 18 - Tray Column - Part I
- Lecture 19 - Tray Column - Part II
- Lecture 20 - Packed Tower
- Lecture 21 - Introduction to Absorption and Solvent selection
- Lecture 22 - Packed Tower Design - Part I
- Lecture 23 - Packed Tower Design - Part II
- Lecture 24 - Packed Tower Design - Part III
- Lecture 25 - Mass Transfer Coefficients Correlation and HETP Concept
- Lecture 26 - Tray Tower Design and Introduction to Multicomponent System
- Lecture 27 - Introduction to Distillation and Phase diagrams
- Lecture 28 - Azeotropes and Enthalpy Concentration Diagrams
- Lecture 29 - Flash Distillation

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- Lecture 30 - Batch and Steam Distillation
- Lecture 31 - Fractional Distillation
- Lecture 32 - Fractional Distillation
- Lecture 33 - Fractional Distillation
- Lecture 34 - Fractional Distillation
- Lecture 35 - Fractional Distillation
- Lecture 36 - Multistage Batch Distillation with Reflux
- Lecture 37 - Fractional Distillation
- Lecture 38 - Ponchan and Savarit Method and Packed Tower Distillation
- Lecture 39 - Multicomponent Distillation

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

NPTEL Video Course - Chemical Engineering - Process Design Decisions and Project Economics

Subject Co-ordinator - Dr. Vijay S. Moholkar

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - General Introduction to the Course and Syllabus
- Lecture 2 - Hierarchical Approach to Process Design - I
- Lecture 3 - Hierarchical Approach to Process Design - Examples
- Lecture 4 - Input Information and Design Aspects of Batch vs. Continuous Process
- Lecture 5 - Input / Output Structure of Flowsheet - Part I
- Lecture 6 - Input / Output Structure of Flowsheet - Part II
- Lecture 7 - Input / Output Structure of Flowsheet - Part III and Recycle Structure of Flowsheet - Part I
- Lecture 8 - Recycle Structure of Flowsheet - Part II
- Lecture 9 - Recycle Structure of Flowsheet - Part III
- Lecture 10 - Recycle Structure of Flowsheet - Part IV and Tutorial - Part I
- Lecture 11 - Tutorial - Part II
- Lecture 12 - Tutorial - Part III
- Lecture 13 - Algorithm and Basic Principles of Reactor Design
- Lecture 14 - Reactor Non-ideality, Residence Time Distribution (RTD) and Types of Chemical Reactions & Catalysis
- Lecture 15 - Types of Reactors and Selection Criteria
- Lecture 16 - Tutorial on Reactor Design and Cost Estimation
- Lecture 17 - General Introduction (Types of Separation Processes and Criteria for Selection of the Processes)
- Lecture 18 - Guidelines for Design of Separation Systems
- Lecture 19 - Design of Distillation Columns - Part I (Sequencing of Columns, Energy Integration / Thermal Coupling)
- Lecture 20 - Design of Distillation Columns - Part II (Plate and Packed Towers, Number of Plates, Diameter and Height)
- Lecture 21 - Tutorial - Part I (Design of Absorption Column)
- Lecture 22 - Tutorial - Part II (Design of Distillation Column)
- Lecture 23 - Concepts and Basic Principles of Energy (or Heat) Integration - Part 1 (Composite Curves and ?T_{min})
- Lecture 24 - Concepts and Basic Principles of Heat Integration - Part 2 (Problem Table Algorithm and Identification of Heat Recovery Targets)
- Lecture 25 - Identification of Area and Cost Targets
- Lecture 26 - Pinch Technology for Heat Exchanger Network Design
- Lecture 27 - Tutorial - I (Composite Curves, Problem Table Algorithm and Enthalpy Intervals)
- Lecture 28 - Tutorial - II (Heat Exchanger Network Synthesis Using Pinch Technology)
- Lecture 29 - Selection of Process, Design of Flowsheet and Materials Balance

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- Lecture 30 - Energy Balance, Process Alternatives and Design of the Absorber
- Lecture 31 - Rules of Thumb & Their Limitations and Tutorial
- Lecture 32 - General Concepts & Principles and Cost Allocation Procedure
- Lecture 33 - Lumped Cost Diagram and Cost Allocation Diagram (Case Study of Hydro-dealkylation Process)
- Lecture 34 - Assessment of Process Alternatives with Cost Allocation Diagram (Case Study of Hydrodealkylation)
- Lecture 35 - Tutorial on Lumped Cost Diagram and Cost Allocation Diagram
- Lecture 36 - Introduction to Chemical Projects and Their Economic Aspects
- Lecture 37 - Selection of the Process and Project Site - Part I
- Lecture 38 - Selection of the Process and Project Site - Part II
- Lecture 39 - Project Cost Estimation - Part I
- Lecture 40 - Project Cost Estimation - Part II
- Lecture 41 - Simplified Cost Model and Depreciation
- Lecture 42 - Time Value of Money
- Lecture 43 - Measures of Profitability and Project Evaluation - Part I
- Lecture 44 - Measures of Profitability and Project Evaluation - Part II
- Lecture 45 - Tutorial on Project Economics - Part I
- Lecture 46 - Tutorial on Project Economics - Part II

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

NPTEL Video Course - Chemical Engineering - NOC:Fluidization Engineering

Subject Co-ordinator - Dr. S.K. Majumder

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction
- Lecture 2 - Particle properties
- Lecture 3 - Particle / Powder Classifications
- Lecture 4 - Minimum Fluidization Velocity
- Lecture 5 - Minimum Fluidization Velocity
- Lecture 6 - Flow regime and its map
- Lecture 7 - Flow regime and its map
- Lecture 8 - Frictional pressure drop in fluidized bed-fluid-solid system
- Lecture 9 - Frictional pressure drop in fluidized Bed-Gas-liquid-solid system
- Lecture 10 - Analysis of Frictional Pressure Drop in Fluidized Bed By Different Models
- Lecture 11 - Gas Distribution Through Distributor
- Lecture 12 - Calculation of gas pumping power consumption in fluidized bed
- Lecture 13 - Bubbling Fluidization Part 1
- Lecture 14 - Bubbling Fluidization Part 2
- Lecture 15 - Bubbling Fluidization Part 3
- Lecture 16 - Bubbling Fluidization Part 4
- Lecture 17 - Bubbling Fluidization Part 5
- Lecture 18 - Bubbling Fluidization Part 6
- Lecture 19 - Entrainment Characteristics (Part 1)
- Lecture 20 - Entrainment Characteristics (Part 2)
- Lecture 21 - Entrainment Characteristics (Part 2)
- Lecture 22 - Entrainment Characteristics (Part 2)
- Lecture 23 - Attrition in Fluidized Bed (Part 2)
- Lecture 24 - Solid movement, mixing
- Lecture 25 - Solid segregation
- Lecture 26 - Solid mixing and segregation
- Lecture 27 - Gas Dispersion and Interchange
- Lecture 28 - Mass transfer in fluidized Bed-Gas-solid system
- Lecture 29 - Mass transfer in fluidized Bed-Gas-liquid-solid system (Continued...)

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Lecture 30 - Heat transfer Characteristics

Lecture 31 - Fluidized bed reactor design and its performance

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

NPTEL Video Course - Chemical Engineering - NOC:An Introduction to Cardiovascular Fluid Mechanics

Subject Co-ordinator - Dr. Raghvendra Gupta

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - An Introduction

Lecture 2 - Fluid Mechanics

Lecture 3 - Solid Mechanics

Lecture 4 - Rheology of blood

Lecture 5 - Blood morphology

Lecture 6 - Blood flow in a channel

Lecture 7 - Viscometers and Rheometers

Lecture 8 - Viscoelasticity

Lecture 9 - Flow Bifurcation

Lecture 10 - Pulsatile Flow 1

Lecture 11 - Pulsatile Flow 2

Lecture 12 - Flow in Elastic Tubes

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

NPTEL Video Course - Chemical Engineering - NOC:Multiphase Microfluidics

Subject Co-ordinator - Dr. Raghvendra Gupta

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - An Introduction
- Lecture 2 - Interface and Surface Tension
- Lecture 3 - Flow Regimes 1
- Lecture 4 - Flow Regimes 2
- Lecture 5 - Taylor Flow 1
- Lecture 6 - Taylor Flow 2
- Lecture 7 - Computational Techniques
- Lecture 8 - Bubble and Droplet Generation
- Lecture 9 - Interface and Surface tension 2
- Lecture 10 - Void Fraction and Pressure Drop
- Lecture 11 - Liquid-Liquid Flow
- Lecture 12 - Ideal annular Flow
- Lecture 13 - Taylor Flow
- Lecture 14 - Taylor Flow
- Lecture 15 - Taylor Flow
- Lecture 16 - Taylor Flow
- Lecture 17 - Flow boiling in microchannels
- Lecture 18 - Flow boiling in microchannels (Continued...)
- Lecture 19 - Flow Measurement Techniques
- Lecture 20 - Particle image Velocimetry
- Lecture 21 - Inertial Microfluidics
- Lecture 22 - Microfluidic applications
- Lecture 23 - Microfluidic applications (Continued...)
- Lecture 24 - Concluding Remarks

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NPTEL Video Course - Chemical Engineering - NOC:Measurement Technique in Multiphase Flows

Subject Co-ordinator - Prof. Rajesh Kumar Upadhyay

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction to Multiphase flow Measurement Techniques

Lecture 2 - Invasive and Non-invasive Techniques

Lecture 3 - Hot Wire Anemometry

Lecture 4 - Optical Fiber Probe

Lecture 5 - Laser Doppler Anemometry (LDA)

Lecture 6 - LDA Post Processing and Particle Image Velocimetry (PIV)

Lecture 7 - PIV and Positron Emission Particle Tracking

Lecture 8 - Radioactive Particle Tracking - I

Lecture 9 - Radioactive Particle Tracking - II

Lecture 10 - Capacitance Probe, Optical Fiber Probe and ECT

Lecture 11 - Gamma-ray and X-ray Tomography, MRI

Lecture 12 - Summary

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

NPTEL Video Course - Chemical Engineering - NOC:Multiphase Flows

Subject Co-ordinator - Prof. Rajesh Kumar Upadhyay

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Multiphase flow introduction
- Lecture 2 - Fundamental definitions and terminology used in Multiphase - I
- Lecture 3 - Fundamental definitions and terminology used in Multiphase - II
- Lecture 4 - Flow Regime Map for Gas-Liquid System
- Lecture 5 - Flow Regime Map for Fluid-Solid System
- Lecture 6 - Pneumatic Conveying
- Lecture 7 - Momentum Equation through Reynolds Transport Theorem
- Lecture 8 - Lockhart Martinelli Correlation
- Lecture 9 - Pressure Drop Calculation for Homogeneous Flow
- Lecture 10 - Pressure Drop Calculation for Separated and Annular Flow Regime
- Lecture 11 - Lagrangian Tracking of Single Particle Under Different Forces
- Lecture 12 - Multiphase Interactions
- Lecture 13 - Multiphase Interactions
- Lecture 14 - Introduction to Multiphase Flow Modeling
- Lecture 15 - Algebraic Slip Method and Euler-Euler Method
- Lecture 16 - KTGF and Euler-Lagrangian Model
- Lecture 17 - Measurement Techniques
- Lecture 18 - Measurement Techniques
- Lecture 19 - Bubble Column
- Lecture 20 - Packed Bed Reactor
- Lecture 21 - Fluidized Bed Reactor
- Lecture 22 - Summary

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

NPTEL Video Course - Chemical Engineering - NOC:Introduction to Polymer Physics (IIT-G)

Subject Co-ordinator - Prof. Amit Kumar

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction to Polymers

Lecture 2 - Ideal Chain Models

Lecture 3 - Ideal and Real Chains

Lecture 4 - Thermodynamics of Polymer Solutions - I

Lecture 5 - Thermodynamics of Polymer Solutions - II

Lecture 6 - Thermodynamics of Polymer Solutions - III

Lecture 7 - Phase Behaviour of Polymer Solutions and Blends

Lecture 8 - Phase Behaviour of Polymer Blends and Copolymers

Lecture 9 - Determination of Polymer Molar Mass

Lecture 10 - Determination of Polymer Molar Mass

Lecture 11 - Determination of Polymer Molar Mass

Lecture 12 - Determination of Polymer Molar Mass

Lecture 13 - Branching

Lecture 14 - Branching, Network Formation and Gelation

Lecture 15 - Gelation and Swelling of Network Polymers

Lecture 16 - Amorphous State of Polymers

Lecture 17 - Crystalline State of Polymers

Lecture 18 - Mechanical Properties of Polymers

Lecture 19 - Viscoelasticity

Lecture 20 - Viscoelasticity, Dynamic Mechanical Analysis and Rheology

Lecture 21 - Rubber Elasticity

Lecture 22 - Unentangled Polymer Dynamics

Lecture 23 - Entangled Polymer Dynamics

Lecture 24 - Review

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

NPTEL Video Course - Chemical Engineering - NOC:Natural Gas Engineering

Subject Co-ordinator - Prof. Pankaj Tiwari

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction to Natural Gas - I
- Lecture 2 - Introduction to Natural Gas - II
- Lecture 3 - Introduction to Natural Gas - III
- Lecture 4 - Wellbore Performance Relationship (WPR)
- Lecture 5 - Choke Performance Relationship (CPR)
- Lecture 6 - Nodal Analysis
- Lecture 7 - Inflow Performance Relationship (IPR) - I
- Lecture 8 - Inflow Performance Relationship (IPR) - II
- Lecture 9 - Gas Well Testing
- Lecture 10 - Wellbore Performance Relationship (WPR)
- Lecture 11 - Choke Performance Relationship (CPR)
- Lecture 12 - Nodal Analysis
- Lecture 13 - Natural Gas Separation - I
- Lecture 14 - Natural Gas Separation - II
- Lecture 15 - Dehydration of Natural Gas
- Lecture 16 - Sweetening of Natural Gas
- Lecture 17 - Compressor Design
- Lecture 18 - Measurement of Natural Gas
- Lecture 19 - Transportation of Natural Gas - I
- Lecture 20 - Transportation of Natural Gas - II
- Lecture 21 - Unconventional production of Natural Gas
- Lecture 22 - Review

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NPTEL Video Course - Chemical Engineering - NOC:Chemical Engineering Thermodynamics

Subject Co-ordinator - Prof. Sasidhar Gumma

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction
- Lecture 2 - First law for closed systems
- Lecture 3 - First law for open systems
- Lecture 4 - Simple processes
- Lecture 5 - Processes involving liquids and ideal gases
- Lecture 6 - Temperature dependency of C_p in an ideal gas
- Lecture 7 - Efficiency of Heat engines and Statement of Second Law
- Lecture 8 - Entropy
- Lecture 9 - Lost Work
- Lecture 10 - Maxwell's Relations
- Lecture 11 - Thermodynamic Diagrams
- Lecture 12 - Thermodynamic Tables, Residual Properties
- Lecture 13 - Virial Equation of State
- Lecture 14 - Residual property relations from EoS
- Lecture 15 - Cubic Equation of State
- Lecture 16 - Cubic Equation of State
- Lecture 17 - Thermodynamic Tables
- Lecture 18 - Correlations for Liquids
- Lecture 19 - Process Involving Phase Changes
- Lecture 20 - Chemical potential
- Lecture 21 - Partial molar properties
- Lecture 22 - Examples
- Lecture 23 - Ideal Solutions
- Lecture 24 - Excess Properties
- Lecture 25 - Fugacity
- Lecture 26 - Calculation of Fugacity using EoS - Part 1
- Lecture 27 - Calculation of Fugacity using EoS - Part 2
- Lecture 28 - Calculation of Fugacity in Mixtures using Cubic EoS
- Lecture 29 - Fugacity in Liquids, Activity Coefficient

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- Lecture 30 - Models for Excess Gibbs free energy - Part 1
- Lecture 31 - Models for Excess Gibbs free energy - Part 2
- Lecture 32 - Vapor Liquid Equilibrium - Part 1
- Lecture 33 - Vapor Liquid Equilibrium - Part 2
- Lecture 34 - Azeotropes
- Lecture 35 - Gamma/Phi Formulation
- Lecture 36 - LLE
- Lecture 37 - VLLE
- Lecture 38 - Enthalpy changes upon reaction
- Lecture 39 - Reaction coordinate
- Lecture 40 - Equilibrium constant
- Lecture 41 - Examples
- Lecture 42 - Conclusion

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

NPTEL Video Course - Chemical Engineering - NOC:Mass Transfer Operations-I

Subject Co-ordinator - Dr. B. Mandal

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction and Overview of Mass Transfer Operation
- Lecture 2 - Molecular and Eddy Diffusion, Diffusion Velocities and Fluxes
- Lecture 3 - Fick's First and Second Law
- Lecture 4 - Steady State Molecular Diffusion in fluids under stagnant and laminar flow conditions
- Lecture 5 - Diffusion through variable cross-sectional area
- Lecture 6 - Gas Phase Diffusion Coefficient measurement
- Lecture 7 - Gas Phase Diffusion Coefficient prediction and liquid phase diffusion coefficient measurement and
- Lecture 8 - Multicomponent diffusion and diffusivity in solids
- Lecture 9 - Mass transfer coefficient concept and classifications
- Lecture 10 - Dimensionless groups and correlations for convective mass transfer coefficients
- Lecture 11 - Mass transfer coefficient in laminar flow
- Lecture 12 - Boundary Layer Theory and mass transfer coefficients in turbulent flow
- Lecture 13 - Mass transfer theories
- Lecture 14 - Interphase mass transfer
- Lecture 15 - Interphase mass transfer and material balance for operating line
- Lecture 16 - Number of ideal stages in counter current operation
- Lecture 17 - Introduction, classification, Sparged and agitated vessels design
- Lecture 18 - Gas dispersed
- Lecture 19 - Sieve Tray
- Lecture 20 - Liquid dispersed
- Lecture 21 - Introduction to absorption, Equilibrium in gas-liquid system, and minimum liquid rate
- Lecture 22 - Design of packed column absorber based on the Individual Mass Transfer Coefficient
- Lecture 23 - Design of packed column absorber based on the Overall Mass Transfer Coefficient
- Lecture 24 - Height Equivalent to a Theoretical Plate (HETP), Design of packed column absorber for dilute and
- Lecture 25 - Absorption in plate column
- Lecture 26 - Introduction to distillation, binary equilibrium diagrams and concept of relative volatility
- Lecture 27 - Distillation in non-ideal systems and concept of enthalpy-concentration diagram
- Lecture 28 - Flash distillation
- Lecture 29 - Batch and steam distillation

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- Lecture 30 - Continuous multistate fractionation
- Lecture 31 - Number of trays by McCabe and Thiele for distillation
- Lecture 32 - Pinch Points and minimum reflux
- Lecture 33 - Reflux below its bubble point
- Lecture 34 - Multiple feeds, multiple product withdrawal or side streams
- Lecture 35 - Multistage batch distillation with reflux
- Lecture 36 - The Ponchon-Savarit method
- Lecture 37 - The Ponchon-Savarit method
- Lecture 38 - Packed Distillation
- Lecture 39 - Introduction to multicomponent distillation and multicomponent flash distillation
- Lecture 40 - Minimum stages and minimum reflux in multicomponent distillation
- Lecture 41 - Multicomponent batch distillation

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

NPTEL Video Course - Chemical Engineering - NOC:Transport Phenomena of Non-Newtonian Fluids

Subject Co-ordinator - Prof. N. Kishore

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction and Basic Concepts

Lecture 2 - Classification of Non-Newtonian Fluids

Lecture 3 - Mathematical Models for Non-Newtonian Fluids

Lecture 4 - Capillary Viscometers

Lecture 5 - Capillary Viscometers

Lecture 6 - Rotational Viscometers

Lecture 7 - Equations of Change for Isothermal Systems

Lecture 8 - Equation of Change for Non-Isothermal Systems

Lecture 9 - Time Independent Non-Newtonian Fluids Flow Through Pipes - 1

Lecture 10 - Time Independent Non-Newtonian Fluids Flow Through Pipes - 2

Lecture 11 - Transition from Laminar to Turbulent Flow in Pipes for GNF

Lecture 12 - Power-law and Bingham Plastic Fluids Flow Between Two Infinite Parallel Plates

Lecture 13 - Flow of Ellis Model and Bingham Plastic Fluids along Inclined and Vertical Plates

Lecture 14 - Power-law Fluids Flow in Concentric Annulus

Lecture 15 - Flow of Non-Newtonian Fluids through Beds of Particles

Lecture 16 - Dispersion in Beds of Particles

Lecture 17 - Liquid-Solid Fluidization by Power-law Liquids

Lecture 18 - Free Convection between Two Vertical Plates

Lecture 19 - Viscous Heat Generation in Coaxial Cylinders

Lecture 20 - (a) Viscous Heating in Slit Flow with Constant Wall Flux Boundary Condition (b) Temperature Dist

Lecture 21 - Temperature Distribution in Fluids Confined Between Two Cylinders

Lecture 22 - Heat Conduction from Sphere Without and With Reaction; and in Spherical Shell

Lecture 23 - Transpiration Cooling

Lecture 24 - Mass Transfer Phenomena of Non-Newtonian Fluids

Lecture 25 - Diffusion through A Stagnant Gas Film; Diffusion into A Falling Liquid Film

Lecture 26 - Diffusion through A Non-Isothermal Spherical Film

Lecture 27 - Simultaneous Heat and Mass Transfer with Multicomponent Diffusion

Lecture 28 - Diffusion Combined with Heterogeneous and Homogeneous Chemical Reactions

Lecture 29 - Combustion of a Carbon Particle

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

- Lecture 30 - Evaporation of Column of Liquid; Melting of Spherical Crystal
- Lecture 31 - Freezing of Salt Water; Effect of Mass Transfer on Heat Transfer Coefficient
- Lecture 32 - Evaporation of a Water Droplet
- Lecture 33 - Boundary Layer Flows and Derivation of Integral Momentum and Energy Equations
- Lecture 34 - Momentum Boundary Layer Thickness for Flow of Power-law Liquids
- Lecture 35 - Thermal Boundary Layer Thickness for Flow of Power-law Liquids

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

NPTEL Video Course - Chemical Engineering - NOC:Fluid Flow Operations

Subject Co-ordinator - Dr. S.K. Majumder

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction
Lecture 2 - Characteristics of fluid (Continued...)
Lecture 3 - Fluid Statics
Lecture 4 - Fluid Statics (Continued...)
Lecture 5 - Fundamentals of flow - Part 1
Lecture 6 - Fundamentals of flow - Part 2
Lecture 7 - One dimensional flow - Part 1
Lecture 8 - One dimensional flow - Part 2
Lecture 9 - One dimensional flow - Part 3
Lecture 10 - Flow of Viscous fluid - Introduction
Lecture 11 - Velocity distribution in laminar flow
Lecture 12 - Velocity distribution in turbulent flow
Lecture 13 - Boundary layer theory
Lecture 14 - Theory of lubrication
Lecture 15 - Frictional resistance
Lecture 16 - Losses in gematric change
Lecture 17 - Losses in geometric change (Continued...)
Lecture 18 - Flow Velocity and Optimum Shape
Lecture 19 - Equation of Energy and Discharge of Water Channel
Lecture 20 - Drag
Lecture 21 - Lift and Cavitation
Lecture 22 - Dimensional Analysis
Lecture 23 - Dimensional Analysis
Lecture 24 - Law of Similarity and Significant Dimensionless Number
Lecture 25 - Compressible Flow - Part 1
Lecture 26 - Compressible Flow - Part 2
Lecture 27 - Measurement of Flow - Part 1
Lecture 28 - Measurement of Flow - Part 2
Lecture 29 - Measurement of Flow - Part 3

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- Lecture 30 - Introduction to multiphase flow
- Lecture 31 - Hydrodynamics in multiphase flow
- Lecture 32 - Hydrodynamics in multiphase flow (Continued...)
- Lecture 33 - Applications of multiphase flow

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

NPTEL Video Course - Chemical Engineering - Fluid Mechanics

Subject Co-ordinator - Dr. V. Shankar

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1
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Lecture 5
Lecture 6
Lecture 7
Lecture 8
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Lecture 12
Lecture 13
Lecture 14
Lecture 15
Lecture 16
Lecture 17
Lecture 18
Lecture 19
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Lecture 40

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NPTEL Video Course - Chemical Engineering - Mass Transfer II

Subject Co-ordinator - Prof. Nishith Verma

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1
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Lecture 13
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NPTEL Video Course - Chemical Engineering - Plantwide Control of Chemical Processes

Subject Co-ordinator - Dr. Nitin Kaistha

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to the course
- Lecture 2 - Process Dynamics and Negative Feedback
- Lecture 3 - PID control
- Lecture 4 - Common Industrial Control Loops and advanced loops
- Lecture 5 - Advanced loops (Continued...) and multivariable systems
- Lecture 6 - Systematic Tuning Using Frequency Domain Analysis
- Lecture 7 - Frequency Domain Analysis
- Lecture 8 - Multivariable Systems
- Lecture 9 - RGA and dynamic decoupling
- Lecture 10 - Model based control
- Lecture 11 - Dynamic Matrix Control
- Lecture 12 - Control of Distillation Columns
- Lecture 13 - Temperature inferential distillation control
- Lecture 14 - Considerations in temperature inferential control
- Lecture 15 - Control of Complex Column Configurations
- Lecture 16 - Control of Heat Integrated Columns
- Lecture 17 - Homogenous extractive distillation
- Lecture 18 - More on complex columns and reactive distillation
- Lecture 19 - Control of reactors
- Lecture 20 - PFR controls (Continued..) & CSTRs
- Lecture 21 - CSTR heat management
- Lecture 22 - Heat Exchangers and Miscellaneous Systems
- Lecture 23 - Degrees of freedom analysis
- Lecture 24 - Degrees of freedom (Continued...)
- Lecture 25 - Illustration of considerations in control structure synthesis
- Lecture 26 - Two column recycle process
- Lecture 27 - Throughput manipulator selection
- Lecture 28 - Plantwide control structure design
- Lecture 29 - Systematizing plantwide control design

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- Lecture 30 - The Luyben design procedure
- Lecture 31 - Role of equipment capacity constraints
- Lecture 32 - Recycle process case study
- Lecture 33 - Recycle process case study (Continued...)
- Lecture 34 - C4 isomerization process case study
- Lecture 35 - C4 isomerization process case study (Continued...)
- Lecture 36 - C4 isomerization process case study
- Lecture 37 - Systematic economic plantwide control design procedure
- Lecture 38 - Ethyl benzene process case study
- Lecture 39 - C4 isomerization process revisited
- Lecture 40 - Contrasting conventional and top-down approach
- Lecture 41 - Cumene process plantwide control

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

NPTEL Video Course - Chemical Engineering - NOC:Thermodynamics Of Fluid Phase Equilibria

Subject Co-ordinator - Dr. Jayant K. Singh

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Review - 1
- Lecture 2 - Review - Temperature and Pressure
- Lecture 3 - Review - Energy Conservation
- Lecture 4 - Properties - Part 1
- Lecture 5 - Properties - Part 2
- Lecture 6 - Mass-energy analysis of open system
- Lecture 7 - Energy analysis of closed system
- Lecture 8 - The Second Law of Thermodynamics
- Lecture 9 - Entropy
- Lecture 10 - Thermodynamic Calculus - 1
- Lecture 11 - Thermodynamic Calculus - 2
- Lecture 12 - Thermodynamic Calculus - 3
- Lecture 13 - Thermodynamic Calculus - 4
- Lecture 14 - Legendre Transformation and Free-energy
- Lecture 15 - Criteria for phase equilibria
- Lecture 16 - Maxwell Relation
- Lecture 17 - Stability Criteria
- Lecture 18 - Thermodynamics of phase equilibrium
- Lecture 19 - Chemical potential and fugacity
- Lecture 20 - General discussion on fugacity
- Lecture 21 - Ideal Gas Mixture - Part 1
- Lecture 22 - Ideal Gas Mixture - Part 2
- Lecture 23 - Partial Molar Properties
- Lecture 24 - Partial Molar Properties from experimental data
- Lecture 25 - Thermodynamics properties from volumetric data - 1
- Lecture 26 - Thermodynamics properties from volumetric data - 2
- Lecture 27 - Fugacity of pure liquids and solids
- Lecture 28 - Thermodynamics properties from volumetric data
- Lecture 29 - Approaches to phase equilibria calculation

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- Lecture 30 - Traditional Approaches to phase equilibria calculations
- Lecture 31 - Algorithms for vapor-liquid equilibria
- Lecture 32 - Probability and Multiplicity
- Lecture 33 - Multiplicity and maximising the multiplicity
- Lecture 34 - Introduction to statistical mechanics
- Lecture 35 - Partition function for independent particles
- Lecture 36 - Lecture 36
- Lecture 37 - Models of Molecular Pair Potentials
- Lecture 38 - Molecular Theory of Corresponding States
- Lecture 39 - Molecular Interactions in Dense Fluid Media
- Lecture 40 - Models for Electrolyte Systems
- Lecture 41 - Membrane Osmometry
- Lecture 42 - Fugacity of liquid mixture - 1
- Lecture 43 - Fugacity of liquid mixture - 2
- Lecture 44 - Models for fugacity of liquid mixtures - 1
- Lecture 45 - Models for fugacity of liquid mixtures - 2
- Lecture 46 - Examples of Fugacity of liquids
- Lecture 47 - Stability of the Fluid Phases
- Lecture 48 - Theories of Solution - I
- Lecture 49 - Theories of Solution - II
- Lecture 50 - Polymer Solutions
- Lecture 51 - Example Problems on Polymer Solutions

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NPTEL Video Course - Chemical Engineering - Biochemical Engineering

Subject Co-ordinator - Dr. Saikat Chakraborty, Dr. Rintu Banerjee

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Fundamentals of Biology & Biotechnology
- Lecture 2 - Glimpses of Microbial World - Bacteria
- Lecture 3 - Virus and Cell Organelles
- Lecture 4 - Carbohydrate
- Lecture 5 - Nucleic Acid
- Lecture 6 - Lipids
- Lecture 7 - Proteins
- Lecture 8 - Biochemistry & Thermodynamics of Enzymes
- Lecture 9 - Enzyme Kinetics
- Lecture 10 - Regulation of Enzyme Activity
- Lecture 11 - Regulation of Enzyme Activity
- Lecture 12 - Effects of Substrate and Inhibition, pH and Temperature on Enzyme Activity
- Lecture 13 - Immobilized Enzymes
- Lecture 14 - Immobilized Enzymes (Continued...)
- Lecture 15 - Interphase Mass Transfer and Reaction in Immobilized Enzymes
- Lecture 16 - Interphase Mass Transfer and Reaction in Immobilized Enzymes (Continued...)
- Lecture 17 - Effectiveness Factor in Immobilized Enzymes
- Lecture 18 - Bioenergetics and Glycolysis
- Lecture 19 - TCA Cycle
- Lecture 20 - Electron Transport Chain & Oxidative Phosphorylation
- Lecture 21 - Pentose Phosphate Pathways Glycogenesis & Glycogenolysis
- Lecture 22 - Urea Cycle, Gluconeogenesis and Glyoxalate Cycle
- Lecture 23 - Microbial Growth
- Lecture 24 - Effect of Mass Transfer on Microbial & Fungal Growth
- Lecture 25 - Effect of Multiple Substrates and Inhibition on Microbial Growth
- Lecture 26 - Design of Bioreactors
- Lecture 27 - Design of Chemostats
- Lecture 28 - Stability of Bioreactors
- Lecture 29 - Stability of Bioreactors (Continued...)

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

- Lecture 30 - Introduction to Receptor - Ligand Binding
- Lecture 31 - Effects of Ligand Depletion and Multiple Receptors on Binding Kinetics
- Lecture 32 - Effects of Ligand Depletion and Multiple Receptors on Binding Kinetics (Continued...)
- Lecture 33 - Receptors-Mediated Endocytosis
- Lecture 34 - Kinetics of Receptor-Mediated Endocytosis
- Lecture 35 - General Model for Receptor-Mediated Endocytosis
- Lecture 36 - Multiple Interacting Microbial Population
- Lecture 37 - Manufacture of Biochemicals
- Lecture 38 - Manufacture of Biochemicals (Continued...) & Strategies for Biomolecules Separation
- Lecture 39 - Strategies for Biomolecules Separation (Continued...)
- Lecture 40 - Strategies for Biomolecules Separation (Continued...)

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

NPTEL Video Course - Chemical Engineering - Microscale Transport Processes

Subject Co-ordinator - Dr. Somnath Ganguly, Prof. S. Dasgupta

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction
Lecture 2 - Introduction (Continued...)
Lecture 3 - Lab on Chip
Lecture 4 - Lab on Chip (Continued...)
Lecture 5 - Microscale manufacturing practices
Lecture 6 - Photolithography
Lecture 7 - Photolithography (Continued...)
Lecture 8 - Deposition
Lecture 9 - Plastic microfluidic devices
Lecture 10 - Mixing
Lecture 11 - Micro Heat Pipes
Lecture 12 - Mixing (Continued...)
Lecture 13 - Mixing (Continued...)
Lecture 14 - Micro Heat Pipes (Continued...)
Lecture 15 - Mixing (Continued...)
Lecture 16 - Dispersion
Lecture 17 - Dispersion (Continued...)
Lecture 18 - Dispersion (Continued...)
Lecture 19 - Electrowetting
Lecture 20 - Electro osmosis
Lecture 21 - Electrowetting (Continued...)
Lecture 22 - Electro osmosis (Continued...)
Lecture 23 - Dielectrophoresis
Lecture 24 - Dielectrophoresis (Continued...)
Lecture 25 - Dielectrophoresis (Continued...)
Lecture 26 - Scaling dimension and issues
Lecture 27 - Slip flow
Lecture 28 - Microstructured reactor
Lecture 29 - Immiscible flow in microchannel

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

- Lecture 30 - Immiscible flow in microchannel (Continued...)
- Lecture 31 - Immiscible flow in microchannel (Continued...)
- Lecture 32 - Scaling dimension and issues (Continued...)
- Lecture 33 - Immiscible flow in microchannel (Continued...)
- Lecture 34 - Plastic device making
- Lecture 35 - Transport processes and their descriptions
- Lecture 36 - Convective fluid dynamics in microchannels
- Lecture 37 - Microfluidic networks
- Lecture 38 - Electrohydrodynamic atomization
- Lecture 39 - Electrohydrodynamic atomization (Continued...)
- Lecture 40 - Interfacial phenomena in thin liquid films

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

NPTEL Video Course - Chemical Engineering - Multiphase Flow

Subject Co-ordinator - Prof. P.K. Das, Prof. Gargi Das

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Estimation of Flow Patterns
- Lecture 3 - Estimation of Flow Patterns (Continued...)
- Lecture 4 - Flow Pattern Maps Fascinating Taylor Bubbles
- Lecture 5 - Definitions and Common Terminologies
- Lecture 6 - Definitions and Common Terminologies (Continued...)
- Lecture 7 - Simple Analytical Models
- Lecture 8 - The Homogeneous Flow Theory
- Lecture 9 - The Homogeneous Flow Theory (Continued...)
- Lecture 10 - Compressible Flow A Recapitulation
- Lecture 11 - Compressible Flow A Recapitulation (Continued...)
- Lecture 12 - Choked Flow Condition for Homogeneous Flow
- Lecture 13 - Drift Flux Model
- Lecture 14 - Drift Flux Model (Continued...)
- Lecture 15 - Drift Flux Model (Continued...)
- Lecture 16 - Drift Flux Model (Continued...)
- Lecture 17 - Separated Flow Model
- Lecture 18 - Separated Flow Model (Continued...)
- Lecture 19 - Separated Flow Model (Continued...)
- Lecture 20 - Separated Flow Model - Condition of Choking
- Lecture 21 - Separated Flow Model - Condition of Choking (Continued...)
- Lecture 22 - Separated Flow Model - Estimation of Frictional Pressure Drop and Void Fraction
- Lecture 23 - Separated Flow Model - Estimation of Frictional Pressure Drop and Void Fraction (Continued...)
- Lecture 24 - Separated Flow Model - Estimation of Frictional Pressure Drop and Void Fraction (Continued...)
- Lecture 25 - Separated Flow Model - Estimation of Frictional Pressure Drop and Void Fraction (Continued...)
- Lecture 26 - Analysis of Specific Flow Regimes
- Lecture 27 - Analysis of Specific Flow Regimes (Continued...)
- Lecture 28 - Analysis of Specific Flow Regimes - Slug Flow (Continued...)
- Lecture 29 - Two Phase Flow with Phase Change - An Introduction to Boiling Heat Transfer

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

- Lecture 30 - Bubble Growth
- Lecture 31 - Different Types of Nucleation
- Lecture 32 - Ibullition from Hot Surfaces
- Lecture 33 - Cycle of Bubble Growth and Departure
- Lecture 34 - Heat Transfer in Different Regimes of Boiling
- Lecture 35 - Heat Transfer in Different Regimes of Boiling (Continued...)
- Lecture 36 - Critical Heat Flux, Film Boiling
- Lecture 37 - Measurement Techniques for Two Phase flow Parameters
- Lecture 38 - Measurement Techniques for Two Phase flow Parameters - Void Fraction Measurement
- Lecture 39 - Measurement Techniques for Two Phase flow Parameters - Void Fraction Measurement (Continued...)
- Lecture 40 - Measurement Techniques for Two Phase flow Parameters - Estimation of Flow Patterns

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

NPTEL Video Course - Chemical Engineering - Novel Separation Processes

Subject Co-ordinator - Prof. S. De

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Fundamentals of Separation Processes
- Lecture 2 - Identification of Novel Separation Processes
- Lecture 3 - Membrane Separation Processes
- Lecture 4 - Membrane Separation Processes (Continued...1)
- Lecture 5 - Membrane Separation Processes (Continued...2)
- Lecture 6 - Membrane Separation Processes (Continued...3)
- Lecture 7 - Membrane Separation Processes (Continued...4)
- Lecture 8 - Membrane Separation Processes (Continued...5)
- Lecture 9 - Membrane Separation Processes (Continued...6)
- Lecture 10 - Membrane Separation Processes (Continued...7)
- Lecture 11 - Membrane Separation Processes (Continued...8)
- Lecture 12 - Membrane Separation Processes (Continued...9)
- Lecture 13 - Membrane Separation Processes (Continued...10)
- Lecture 14 - Membrane Separation Processes (Continued...11)
- Lecture 15 - Membrane Separation Processes (Continued...12)
- Lecture 16 - Membrane Separation Processes (Continued...13)
- Lecture 17 - Membrane Separation Processes (Continued...14)
- Lecture 18 - Membrane Separation Processes (Continued...15)
- Lecture 19 - Membrane Separation Processes (Continued...16)
- Lecture 20 - Membrane Separation Processes (Continued...17)
- Lecture 21 - Membrane Separation Processes (Continued...18)
- Lecture 22 - External Field Induced Membrane Separation Processes
- Lecture 23 - External Field Induced Membrane Separation Processes (Continued...1)
- Lecture 24 - External Field Induced Membrane Separation Processes (Continued...2)
- Lecture 25 - External Field Induced Membrane Separation Processes (Continued...3)
- Lecture 26 - External Field Induced Membrane Separation Processes (Continued...4)
- Lecture 27 - Gas Separation
- Lecture 28 - Gas Separation (Continued...)
- Lecture 29 - Surfactant Based Separation Processes

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

- Lecture 30 - Surfactant Based Separation Processes (Continued...)
- Lecture 31 - Micellar Enhanced Ultrafiltration
- Lecture 32 - Micellar Enhanced Ultrafiltration (Continued...)
- Lecture 33 - Liquid Membranes
- Lecture 34 - Liquid Membranes (Continued...)
- Lecture 35 - Centrifugal Separation Processes
- Lecture 36 - Chromatographic Separation Processes
- Lecture 37 - Chromatographic Separation Processes (Continued...)
- Lecture 38 - Ion Exchange Processes
- Lecture 39 - Electrophoretic Separation Methods
- Lecture 40 - Electrophoretic Separation Methods (Continued...)
- Lecture 41 - Supercritical Fluid Extraction

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

NPTEL Video Course - Chemical Engineering - Process Control and Instrumentation

Subject Co-ordinator - Dr. D. Sarkar, Dr. A.K. Jana

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Process Control
- Lecture 2 - Introduction to Process Control (Continued...)
- Lecture 3 - Mathematical Modeling (Continued...1)
- Lecture 4 - Mathematical Modeling (Continued...2)
- Lecture 5 - Mathematical Modeling (Continued...3)
- Lecture 6 - Dynamic Behavior of Chemical Processes
- Lecture 7 - Dynamic Behavior of Chemical Processes (Continued...1)
- Lecture 8 - Dynamic Behavior of Chemical Processes (Continued...2)
- Lecture 9 - Dynamic Behavior of Chemical Processes (Continued...3)
- Lecture 10 - Dynamic Behavior of Chemical Processes (Continued...4)
- Lecture 11 - Dynamic Behavior of Chemical Processes (Continued...5)
- Lecture 12 - Dynamic Behavior of Chemical Processes (Continued...6)
- Lecture 13 - Dynamic Behavior of Chemical Processes (Continued...7)
- Lecture 14 - Dynamic Behavior of Chemical Processes (Continued...8)
- Lecture 15 - Feedback Control Schemes
- Lecture 16 - Feedback Control Schemes (Continued...1)
- Lecture 17 - Feedback Control Schemes (Continued...2)
- Lecture 18 - Feedback Control Schemes (Continued...3)
- Lecture 19 - Feedback Control Schemes (Continued...4)
- Lecture 20 - Feedback Control Schemes (Continued...5)
- Lecture 21 - Feedback Control Schemes (Continued...6)
- Lecture 22 - Feedback Control Schemes (Continued...7)
- Lecture 23 - Feedback Control Schemes (Continued...8)
- Lecture 24 - Feedback Control Schemes (Continued...9)
- Lecture 25 - Feedback Control Schemes (Continued...10)
- Lecture 26 - Feedback Control Schemes (Continued...11)
- Lecture 27 - Feedback Control Schemes (Continued...12)
- Lecture 28 - Feedback Control Schemes (Continued...13)
- Lecture 29 - Feedback Control Schemes (Continued...14)

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- Lecture 30 - Advanced Control Schemes
- Lecture 31 - Advanced Control Schemes (Continued...1)
- Lecture 32 - Advanced Control Schemes (Continued...2)
- Lecture 33 - Advanced Control Schemes (Continued...3)
- Lecture 34 - Advanced Control Schemes (Continued...4)
- Lecture 35 - Instrumentation
- Lecture 36 - Instrumentation
- Lecture 37 - Instrumentation
- Lecture 38 - Instrumentation
- Lecture 39 - Instrumentation
- Lecture 40 - Instrumentation
- Lecture 41 - Transducer Elements
- Lecture 42 - Pressure Measurement
- Lecture 43 - Pressure Measurement (Continued...1)
- Lecture 44 - Pressure Measurement (Continued...2)

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

NPTEL Video Course - Chemical Engineering - Instability and Patterning of Thin Polymer Films

Subject Co-ordinator - Dr. R. Mukherjee

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Introduction (Continued...)
- Lecture 3 - Some Fundamental Surface Related Concepts - I
- Lecture 4 - Surface Tension (in terms of molecular interactions)
- Lecture 5 - Effect Surface Tension
- Lecture 6 - Young Laplace Equation
- Lecture 7 - Rayleish Instability
- Lecture 8 - Meso Scale Fabrication Approaches
- Lecture 9 - Photo Lithography - I
- Lecture 10 - Photo Lithography - II
- Lecture 11 - Photo Lithography - III
- Lecture 12 - Photo Lithography - IV
- Lecture 13 - Photo Lithography - V
- Lecture 14 - Nano Imprint Lithography
- Lecture 15 - Nano Imprint Lithography (Continued...)
- Lecture 16 - Soft Lithography - I
- Lecture 17 - Soft Lithography - II
- Lecture 18 - Soft Lithography - III
- Lecture 19 - Soft Lithography - IV
- Lecture 20 - Soft Lithography - V
- Lecture 21 - Soft Lithography - VI
- Lecture 22 - Atomic Force Microscope - I
- Lecture 23 - Atomic Force Microscope - II
- Lecture 24 - Atomic Force Microscope - III
- Lecture 25 - Atomic Force Microscope - IV
- Lecture 26 - Atomic Force Microscope - V
- Lecture 27 - Intermolecular Forces between Particles and Surfaces - I
- Lecture 28 - Intermolecular Forces between Particles and Surfaces - II
- Lecture 29 - Intermolecular Forces between Particles and Surfaces - III

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

- Lecture 30 - Intermolecular Forces between Particles and Surfaces - IV
- Lecture 31 - Spontaneous instability and dewetting of thin polymer film - I
- Lecture 32 - Spontaneous instability and dewetting of thin polymer film - II
- Lecture 33 - Spontaneous instability and dewetting of thin polymer film - III
- Lecture 34 - Spontaneous instability and dewetting of thin polymer film - IV
- Lecture 35 - Spontaneous instability and dewetting of thin polymer film - V
- Lecture 36 - Spontaneous instability and dewetting of thin polymer film - VI
- Lecture 37 - Spontaneous instability and dewetting of thin polymer film - VII
- Lecture 38 - Template Guided Dewetting
- Lecture 39 - Elastic Contact Instability and Lithography
- Lecture 40 - Gradient Surfaces

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

NPTEL Video Course - Chemical Engineering - Advanced Mathematical Techniques in Chemical Engineering

Subject Co-ordinator - Prof. S. De

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to vector space
- Lecture 2 - Introduction to vector space (Continued...)
- Lecture 3 - Onto, into, one to one function
- Lecture 4 - Vectors
- Lecture 5 - Vectors (Continued...)
- Lecture 6 - Contraction Mapping
- Lecture 7 - Contraction Mapping (Continued...)
- Lecture 8 - Matrix, Determinant
- Lecture 9 - Eigenvalue Problem in Discrete Domain
- Lecture 10 - Eigenvalue Problem in Discrete Domain (Continued...)
- Lecture 11 - Eigenvalue Problem in Discrete Domain (Continued...)
- Lecture 12 - Eigenvalue Problem in Discrete Domain (Continued...)
- Lecture 13 - Stability Analysis
- Lecture 14 - Stability Analysis (Continued...)
- Lecture 15 - Stability Analysis (Continued...)
- Lecture 16 - More Examples
- Lecture 17 - Partial Differential Equations
- Lecture 18 - Partial Differential Equations (Continued...)
- Lecture 19 - Eigenvalue Problem in Continuous Domain
- Lecture 20 - Special ODEs
- Lecture 21 - Adjoint Operator
- Lecture 22 - Theorems of Eigenvalues and Eigenfunction
- Lecture 23 - Solution PDE
- Lecture 24 - Solution of Parabolic PDE
- Lecture 25 - Solution of Parabolic PDE
- Lecture 26 - Solution of Higher Dimensional PDEs
- Lecture 27 - Solution of Higher Dimensional PDEs (Continued...)
- Lecture 28 - Four Dimensional Parabolic PDE
- Lecture 29 - Solution of Elliptic and Hyperbolic PDE

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

- Lecture 30 - Solution of Elliptic and Hyperbolic PDE (Continued...)
- Lecture 31 - PDE in Cylindrical and Spherical Coordinate
- Lecture 32 - Solution of non-homogeneous PDE
- Lecture 33 - Solution of non-homogeneous PDE (Continued...)
- Lecture 34 - Solution of non-homogeneous Parabolic PDE
- Lecture 35 - Solution of non-homogeneous Elliptic PDE
- Lecture 36 - Solution of non-homogeneous Elliptic PDE (Continued...)
- Lecture 37 - Similarity Solution
- Lecture 38 - Similarity Solution (Continued...)
- Lecture 39 - Integral Method
- Lecture 40 - Laplace Transform
- Lecture 41 - Fourier Transform

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

NPTEL Video Course - Chemical Engineering - NOC:Introduction to Process Modeling in Membrane Separation Processes

Subject Co-ordinator - Prof. S. De

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Fundamentals of Separation Processes and Introduction of Membrane System
- Lecture 2 - Fundamentals of Separation Processes and Introduction of Membrane System (Continued...)
- Lecture 3 - Fundamentals of Separation Processes and Introduction of Membrane System (Continued...)
- Lecture 4 - Fundamentals of Separation Processes and Introduction of Membrane System (Continued...)
- Lecture 5 - Modeling of Reverse Osmosis
- Lecture 6 - Concentration Polarization
- Lecture 7 - Osmotic Pressure Controlling Filtration
- Lecture 8 - Osmotic Pressure Controlling Filtration (Continued...)
- Lecture 9 - Osmotic Pressure Controlling Filtration (Continued...)
- Lecture 10 - Osmotic Pressure Controlling Filtration (Continued...)
- Lecture 11 - Osmotic Pressure Controlling Filtration (Continued...)
- Lecture 12 - Osmotic Pressure Controlling Filtration (Continued...)
- Lecture 13 - Modeling of Gel Layer Controlling Filtration
- Lecture 14 - Modeling of Gel Layer Controlling Filtration (Continued...)
- Lecture 15 - Modeling of Gel Layer Controlling Filtration (Continued...) and Resistance in Series Models
- Lecture 16 - Design of Membrane Module
- Lecture 17 - Design of Membrane Module (Continued...)
- Lecture 18 - Design of Membrane Module (Continued...)
- Lecture 19 - Modeling of Dialysis
- Lecture 20 - Modeling of Dialysis (Continued...)

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

NPTEL Video Course - Chemical Engineering - NOC:Soft Nano Technology

Subject Co-ordinator - Dr. R. Mukherjee

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction - 1
Lecture 2 - Introduction - 2
Lecture 3 - Introduction - 3
Lecture 4 - Fundamental Concepts Related to Surface Tension - 1
Lecture 5 - Fundamental Concepts Related to Surface Tension - 2
Lecture 6 - Fundamental Concepts Related to Surface Tension - 3
Lecture 7 - Fundamental Concepts Related to Surface Tension - 4
Lecture 8 - Components of Surface Tension - 1
Lecture 9 - Components of Surface Tension - 2
Lecture 10 - Self Assembly of Surfactant Molecules
Lecture 11 - Laplace Pressure
Lecture 12 - Photo Lithography - 1
Lecture 13 - Photo Lithography - 2
Lecture 14 - Photo Lithography - 3
Lecture 15 - Photo Lithography - 4
Lecture 16 - Photo Lithography - 5
Lecture 17 - Photo Lithography - 6
Lecture 18 - Soft Lithography - I
Lecture 19 - Soft Lithography - 2
Lecture 20 - Soft Lithography - 3
Lecture 21 - Soft Lithography - 4
Lecture 22 - Soft Lithography - 5
Lecture 23 - Soft Lithography - 6
Lecture 24 - Atomic Force Microscope - 1
Lecture 25 - Atomic Force Microscope - 2
Lecture 26 - Atomic Force Microscope - 3
Lecture 27 - Atomic Force Microscope - 4
Lecture 28 - Atomic Force Microscope - 5
Lecture 29 - Atomic Force Microscope - 6

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

- Lecture 30 - Dewetting - 1
- Lecture 31 - Dewetting - 2
- Lecture 32 - VdW Interaction Between Two Surfaces
- Lecture 33 - Interaction Between Two Surfaces - 2
- Lecture 34 - Interaction Between Two Surfaces - 3
- Lecture 35 - Dewetting - 3
- Lecture 36 - Pattern Directed Dewetting - I
- Lecture 37 - Pattern Directed Dewetting - II
- Lecture 38 - Spin Dewetting
- Lecture 39 - Elastic Contact Instability - I
- Lecture 40 - Elastic Contact Instability - II

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

NPTEL Video Course - Chemical Engineering - NOC:Adiabatic Two-Phase Flow and Flow Boiling in Microchannel

Subject Co-ordinator - Prof. Gargi Das

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Brief Introduction to Multiphase Flow
- Lecture 2 - Brief Introduction to Multiphase Flow (Continued...)
- Lecture 3 - Two Phase Flow through Micro Channels
- Lecture 4 - Two Phase Flow through Micro Channels (Continued...)
- Lecture 5 - Criteria for Confinement for in Case of Two Phase Flow
- Lecture 6 - Pertinent Dimensionless Numbers in Two Phase
- Lecture 7 - Flow Pattern Maps for Milli and Micro Systems
- Lecture 8 - Pattern Transition from Energy Minimisation Principle
- Lecture 9 - Experimental Identification of Flow Regimes
- Lecture 10 - Experimental Identification of Flow Regimes (Continued...)
- Lecture 11 - Flow Regimes and Void Fraction Estimation
- Lecture 12 - Influence of Operating Parameter on Flow Patterns
- Lecture 13 - Influence of Operating Parameter on Flow Patterns (Continued...)
- Lecture 14 - Influence of Operating Parameter on Flow Patterns (Continued...)
- Lecture 15 - Influence of Operating Parameter on Flow Patterns (Continued...)
- Lecture 16 - Void Fraction Characteristic Mini and Micro Channel
- Lecture 17 - Void Fraction and Pressure Drop in Reduced Dimensions - Experimental results
- Lecture 18 - Void Fraction and Pressure Drop in Reduced Dimensions - Experimental results (Continued...)
- Lecture 19 - Theoretical Analysis of Two Phase Flow in Reduced Dimensions
- Lecture 20 - Theoretical Analysis of Two Phase Flow in Reduced Dimensions (Continued...)
- Lecture 21 - Flow Pattern based Analysis in Micro Systems - Drift Flux Model
- Lecture 22 - Flow Pattern based Modelling - Slug Flow Model
- Lecture 23 - Flow Boiling in Microchannels
- Lecture 24 - Tutorial - I
- Lecture 25 - Tutorial - II

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NPTEL Video Course - Chemical Engineering - NOC:Phase Equilibrium Thermodynamics

Subject Co-ordinator - Prof. Gargi Das

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction
Lecture 2 - Introduction (Continued...)
Lecture 3 - First Law of Thermodynamics
Lecture 4 - Second Law of Thermodynamics
Lecture 5 - Second Law of Thermodynamics (Continued...)
Lecture 6 - Entropy Change during Spontaneous Processes
Lecture 7 - Criteria of Spontaneity
Lecture 8 - Criteria of Spontaneity (Continued...)
Lecture 9 - Thermodynamic Network
Lecture 10 - Thermodynamic Network (Continued...)
Lecture 11 - Tutorial 1
Lecture 12 - Gibbs free energy as a function of temperature and pressure
Lecture 13 - P-v-T behaviour of gases
Lecture 14 - P-v-T behaviour (Continued...)
Lecture 15 - P-v-T behaviour (Continued...)
Lecture 16 - P-v-T behaviour (Continued...)
Lecture 17 - Tutorial 2
Lecture 18 - Property estimation from P-v-T behaviour
Lecture 19 - Property estimation (Continued...)
Lecture 20 - Concept of chemical potential
Lecture 21 - Chemical potential (Continued...)
Lecture 22 - Homogeneous open systems
Lecture 23 - Homogeneous open systems (Continued...)
Lecture 24 - Heterogeneous Closed Systems
Lecture 25 - Tutorial 3
Lecture 26 - Concept of fugacity
Lecture 27 - Fugacity (Continued...)
Lecture 28 - Estimation of fugacity coefficients
Lecture 29 - Fugacity of condensed phase

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

- Lecture 30 - Mixtures
- Lecture 31 - Mixtures (Continued...)
- Lecture 32 - Tutorial 4
- Lecture 33 - Partial molar properties
- Lecture 34 - Partial molar properties (Continued...)
- Lecture 35 - Partial molar fugacity
- Lecture 36 - Ideal solutions
- Lecture 37 - Ideal solutions (Continued...)
- Lecture 38 - Ideal solutions (Continued...)
- Lecture 39 - Ideal solutions (Continued...)
- Lecture 40 - Non-ideal solutions
- Lecture 41 - Non-ideal solutions (Continued...)
- Lecture 42 - Non-ideal solutions (Continued...)
- Lecture 43 - Non-ideal solutions (Continued...)
- Lecture 44 - Non-ideal solutions (Continued...)
- Lecture 45 - Deviations from ideal dilute solutions
- Lecture 46 - Tutorial
- Lecture 47 - Tutorial
- Lecture 48
- Lecture 49
- Lecture 50
- Lecture 51
- Lecture 52

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

NPTEL Video Course - Chemical Engineering - NOC:Transport Phenomena

Subject Co-ordinator - Prof. Sunando Dasgupta

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Fourier and Fick's Laws
- Lecture 3 - Shell Momentum Balance
- Lecture 4 - Example of Shell Momentum Balance
- Lecture 5 - Example of Shell Momentum Balance (Continued...)
- Lecture 6 - Example of Shell Momentum Balance (Continued...)
- Lecture 7 - Example of Shell Momentum Balance (Continued...)
- Lecture 8 - Example of Shell Momentum Balance (Continued...)
- Lecture 9 - Equations of Change for Isothermal Systems
- Lecture 10 - Equations of Change for Isothermal Systems (Continued...)
- Lecture 11 - Equations of Change for Isothermal Systems (Continued...)
- Lecture 12 - Equations of Change for Isothermal Systems (Continued...)
- Lecture 13 - Equations of Change for Isothermal Systems (Continued...)
- Lecture 14 - Equations of Change for Isothermal Systems (Continued...)
- Lecture 15 - Unsteady Flow
- Lecture 16 - Boundary Layers
- Lecture 17 - Boundary Layers (Continued...)
- Lecture 18 - Boundary Layers (Continued...)
- Lecture 19 - Boundary Layers (Continued...)
- Lecture 20 - Boundary Layers (Continued...)
- Lecture 21 - Boundary Layers (Continued...)
- Lecture 22 - Boundary Layers (Continued...)
- Lecture 23 - Boundary Layers (Continued...)
- Lecture 24 - Boundary Layers (Continued...)
- Lecture 25 - Turbulent Boundary Layers
- Lecture 26 - Turbulent Boundary Layers (Continued...)
- Lecture 27 - Turbulent Boundary Layers (Continued...)
- Lecture 28 - Drag
- Lecture 29 - Drag (Continued...)

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- Lecture 30 - Heat Transfer Basics
- Lecture 31 - Heat Transfer Basics (Continued...)
- Lecture 32 - 1-D Heat Conduction - Temperature Distributions
- Lecture 33 - 1-D Heat Conduction - Shell Heat Balance
- Lecture 34 - Shell Heat Balance
- Lecture 35 - Viscous Dissipation
- Lecture 36 - Transient Conduction
- Lecture 37 - Transient Conduction (Continued...)
- Lecture 38 - Forced Convection
- Lecture 39 - Energy Equation
- Lecture 40 - Energy Equation (Continued...)
- Lecture 41 - Free Convection
- Lecture 42 - Thermal Boundary Layer
- Lecture 43 - Mass Transfer
- Lecture 44 - Mass Transfer (Continued...)
- Lecture 45 - Mass Transfer (Continued...)
- Lecture 46 - Mass Transfer (Continued...)
- Lecture 47 - Mass Transfer (Continued...)
- Lecture 48 - Mass Transfer (Continued...)
- Lecture 49 - Mass Transfer (Continued...)
- Lecture 50 - Mass Transfer (Continued...)
- Lecture 51 - (Lecture Missing)
- Lecture 52 - Boundary Layer Similarity
- Lecture 53 - Boundary Layer - Analogy
- Lecture 54 - Analogy - Tutorial I
- Lecture 55 - Analogy - Tutorial II

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

NPTEL Video Course - Chemical Engineering - NOC:Chemical Process Instrumentation

Subject Co-ordinator - Prof. Debasis Sarkar

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - General Principles and Representation of Instruments
Lecture 2 - General Principles and Representation of Instruments (Continued...)
Lecture 3 - General Principles and Representation of Instruments (Continued...)
Lecture 4 - General Principles and Representation of Instruments (Continued...)
Lecture 5 - General Principles and Representation of Instruments (Continued...)
Lecture 6 - Performance Characteristics of Instruments and Data Analysis - I
Lecture 7 - Performance Characteristics of Instruments and Data Analysis - I (Continued...)
Lecture 8 - Performance Characteristics of Instruments and Data Analysis - I (Continued...)
Lecture 9 - Performance Characteristics of Instruments and Data Analysis - I (Continued...)
Lecture 10 - Performance Characteristics of Instruments and Data Analysis - I (Continued...)
Lecture 11 - Performance Characteristics of Instruments and Data Analysis - II
Lecture 12 - Performance Characteristics of Instruments and Data Analysis - II (Continued...)
Lecture 13 - Performance Characteristics of Instruments and Data Analysis - II (Continued...)
Lecture 14 - Performance Characteristics of Instruments and Data Analysis - II (Continued...)
Lecture 15 - Performance Characteristics of Instruments and Data Analysis - II (Continued...)
Lecture 16 - Transducer Elements
Lecture 17 - Transducer Elements (Continued...)
Lecture 18 - Transducer Elements (Continued...)
Lecture 19 - Transducer Elements (Continued...)
Lecture 20 - Transducer Elements (Continued...)
Lecture 21 - Pressure Measurement
Lecture 22 - Pressure Measurement
Lecture 23 - Pressure Measurement
Lecture 24 - Pressure Measurement
Lecture 25 - Pressure Measurement
Lecture 26 - High Vacuum Measurement
Lecture 27 - High Vacuum Measurement (Continued...)
Lecture 28 - High Vacuum Measurement (Continued...)
Lecture 29 - High Vacuum Measurement (Continued...)

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

- Lecture 30 - Pressure Measurement
- Lecture 31 - Temperature Measurement
- Lecture 32 - Temperature Measurement (Continued...)
- Lecture 33 - Temperature Measurement (Continued...)
- Lecture 34 - Temperature Measurement (Continued...)
- Lecture 35 - Temperature Measurement (Continued...)
- Lecture 36 - Temperature Measurement (Continued...)
- Lecture 37 - Temperature Measurement (Continued...)
- Lecture 38 - Temperature Measurement (Continued...)
- Lecture 39 - Temperature Measurement (Continued...)
- Lecture 40 - Temperature Measurement (Continued...)
- Lecture 41 - Flow Measurement
- Lecture 42 - Flow Measurement (Continued...)
- Lecture 43 - Flow Measurement (Continued...)
- Lecture 44 - Flow Measurement (Continued...)
- Lecture 45 - Flow Measurement (Continued...)
- Lecture 46 - Level Measurement
- Lecture 47 - Level Measurement (Continued...)
- Lecture 48 - Level Measurement (Continued...)
- Lecture 49 - Level Measurement (Continued...)
- Lecture 50 - Level Measurement (Continued...)
- Lecture 51 - Miscellaneous Measurements
- Lecture 52 - Miscellaneous Measurements
- Lecture 53 - Miscellaneous Measurements
- Lecture 54 - Miscellaneous Measurements
- Lecture 55 - Miscellaneous Measurements
- Lecture 56 - Pneumatic Control Valve
- Lecture 57 - Pneumatic Control Valve (Continued...)
- Lecture 58 - Pneumatic Control Valve (Continued...) and P&ID
- Lecture 59 - GATE Questions
- Lecture 60 - GATE Questions (Continued...)

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

NPTEL Video Course - Chemical Engineering - NOC:Optimization in Chemical Engineering

Subject Co-ordinator - Prof. Debasis Sarkar

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction to Optimization
Lecture 2 - Introduction to Optimization (Continued...)
Lecture 3 - Introduction to Optimization (Continued...)
Lecture 4 - Introduction of Optimization (Continued...)
Lecture 5 - Introduction of Optimization (Continued...)
Lecture 6 - Optimization Problem Formulation
Lecture 7 - Optimization Problem Formulation (Continued...)
Lecture 8 - Optimization Problem Formulation (Continued...)
Lecture 9 - Optimization Problem Formulation (Continued...)
Lecture 10 - Optimization Problem Formulation (Continued...)
Lecture 11 - Basic Concepts of Optimization - I
Lecture 12 - Basic Concepts of Optimization - I (Continued...)
Lecture 13 - Basic Concepts of Optimization - I (Continued...)
Lecture 14 - Basic Concepts of Optimization - I (Continued...)
Lecture 15 - Basic Concepts of Optimization - I (Continued...)
Lecture 16 - Basic Concepts of Optimization - II
Lecture 17 - Basic Concepts of Optimization - II (Continued...)
Lecture 18 - Basic Concepts of Optimization - II (Continued...)
Lecture 19 - Basic Concepts of Optimization - II (Continued...)
Lecture 20 - Basic Concepts of Optimization - II (Continued...)
Lecture 21 - Unconstrained Single Variable Optimization
Lecture 22 - Unconstrained Single Variable Optimization
Lecture 23 - Unconstrained Single Variable Optimization
Lecture 24 - Unconstrained Single Variable Optimization
Lecture 25 - Unconstrained Single Variable Optimization
Lecture 26 - Unconstrained Multivariable Optimization
Lecture 27 - Unconstrained Multivariable Optimization
Lecture 28 - Unconstrained Multivariable Optimization
Lecture 29 - Unconstrained Multivariable Optimization

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- Lecture 30 - Unconstrained Multivariable Optimization
- Lecture 31 - Unconstrained Multivariable Optimization
- Lecture 32 - Unconstrained Multivariable Optimization
- Lecture 33 - Unconstrained Multivariable Optimization
- Lecture 34 - Unconstrained Multivariable Optimization
- Lecture 35 - Unconstrained Multivariable Optimization
- Lecture 36 - Introduction to Linear Programming
- Lecture 37 - Introduction to Linear Programming (Continued...)
- Lecture 38 - Introduction to Linear Programming (Continued...)
- Lecture 39 - Introduction to Linear Programming (Continued...)
- Lecture 40 - Introduction to Linear Programming (Continued...)
- Lecture 41 - Linear Programming - The Simplex Method
- Lecture 42 - Linear Programming - The Simplex Method (Continued...)
- Lecture 43 - Linear Programming - The Simplex Method (Continued...)
- Lecture 44 - Linear Programming - The Simplex Method (Continued...)
- Lecture 45 - Linear Programming - The Simplex Method (Continued...)
- Lecture 46 - Constrained Nonlinear Programming
- Lecture 47 - Constrained Nonlinear Programming (Continued...)
- Lecture 48 - Constrained Nonlinear Programming (Continued...)
- Lecture 49 - Constrained Nonlinear Programming (Continued...)
- Lecture 50 - Constrained Nonlinear Programming (Continued...)
- Lecture 51 - Applications of Optimization
- Lecture 52 - Applications of Optimization (Continued...)
- Lecture 53 - Applications of Optimization (Continued...)
- Lecture 54 - Applications of Optimization (Continued...)
- Lecture 55 - Applications of Optimization (Continued...)
- Lecture 56 - Software Tools for Optimization
- Lecture 57 - Software Tools for Optimization (Continued...)
- Lecture 58 - Software Tools for Optimization (Continued...)
- Lecture 59 - Software Tools for Optimization (Continued...)
- Lecture 60 - Software Tools for Optimization (Continued...)

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

NPTEL Video Course - Chemical Engineering - NOC:Heat Transfer (2018)

Subject Co-ordinator - Prof. Sunando Dasgupta

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Heat Transfer
- Lecture 2 - Introduction to Heat Transfer
- Lecture 3 - Heat Diffusion Equation
- Lecture 4 - Relevant Boundary Conditions in Conduction
- Lecture 5 - One Dimensional Steady State Conduction
- Lecture 6 - Temperature Distribution in Radial Systems
- Lecture 7 - Tutorial Problem on Critical Insulation Thickness
- Lecture 8 - Heat Source Systems
- Lecture 9 - Tutorial Problems of Heat Generating Systems
- Lecture 10 - Transient Conduction
- Lecture 11 - Lumped Capacitance (Continued...) and Tutorial Problem
- Lecture 12 - Transient heat Conduction
- Lecture 13 - Transient Conduction - Heisler Chart
- Lecture 14 - Heat Transfer from Extended Surface
- Lecture 15 - Fins and General Conduction Analysis
- Lecture 16 - Fundamentals of Convection
- Lecture 17 - Equations of Change for Non-isothermal Systems
- Lecture 18 - Equations of Change for Non-isothermal Systems (Continued...)
- Lecture 19 - Tutorial on the Application of Energy Equation
- Lecture 20 - Nusselt Number of a heated sphere in Stagnant Air
- Lecture 21 - Momentum and Thermal Boundary Layers
- Lecture 22 - The Flat Plate in Parallel Flow - Hydrodynamics and Momentum Transfer
- Lecture 23 - The Flat Plate in Parallel Flow - Heat Transfer
- Lecture 24 - The Effects of Turbulence
- Lecture 25 - Turbulent External Flow
- Lecture 26 - Heat and Momentum Transfer Analogy
- Lecture 27 - Mixed Boundary Layers
- Lecture 28 - Tutorial Problem on External Flow and Behavior of Heat Transfer Coefficient
- Lecture 29 - Tutorial Problem in External Flow and Convection

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- Lecture 30 - Tutorial Problem in External Flow and Convection
- Lecture 31 - Tutorial Problem in External Flow and Convection
- Lecture 32 - Internal Flow Heat Transfer
- Lecture 33 - Internal Flow Heat Transfer (Continued...)
- Lecture 34 - Internal Flow Heat Transfer (Continued...)
- Lecture 35 - Internal Flow and Heat Transfer (Continued...)
- Lecture 36 - Internal Flow and Heat Transfer (Tutorial)
- Lecture 37 - Free Convection
- Lecture 38 - Heat Exchangers
- Lecture 39 - Heat Exchangers
- Lecture 40 - Heat Exchangers
- Lecture 41 - Tutorial Problems on Heat Exchanger Calculations
- Lecture 42 - Tutorial Problem on LMTD and Dirt Factor
- Lecture 43 - Epsilon-NTU Method - 1
- Lecture 44 - Epsilon-NTU Method - 1 (Continued...)
- Lecture 45 - Tutorial Problems on Epsilon - NTU Methods
- Lecture 46 - Tutorial Problems on Epsilon - NTU Methods
- Lecture 47 - Boiling, Evaporation and Evaporators
- Lecture 48 - Radiation - Fundamental Concepts
- Lecture 49 - Spectral Blackbody Radiation Intensity and Emissive Power
- Lecture 50 - Wein's Law, Stephen Boltzmann Law, Blackbody Radiation Function, Tutorial Problem
- Lecture 51 - Kirchhoff's Law
- Lecture 52 - Tutorial on Emissivity, Absorptivity and Blackbody Radiation Functions
- Lecture 53 - Solar Radiation and the Concept of View Factors
- Lecture 54 - Determination of View Factors
- Lecture 55 - Radiosity Blackbody Radiation Exchanges, Relevant Problem
- Lecture 56 - Network Method for Radiation Exchange in an Enclosure
- Lecture 57 - Network Method - Two and Three Zone Enclosures
- Lecture 58 - Tutorial Problem on Radiation Exchange using the Network Method
- Lecture 59 - Radiation Shields
- Lecture 60 - Gaseous Radiation (Participating Medium)

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

NPTEL Video Course - Chemical Engineering - Chemical Engineering Thermodynamics

Subject Co-ordinator - Prof. M.S. Ananth

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Thermodynamics and the Chemical Industry
- Lecture 2 - James Prescott Joule and the first law
- Lecture 3 - Sadi Carnot and the second law
- Lecture 4 - Equilibrium and Extrema in work
- Lecture 5 - Illustrative Calculations - I
- Lecture 6 - Properties of pure substances
- Lecture 7 - The p-h chart
- Lecture 8 - Work calculation
- Lecture 9 - Illustrative Calculations - II
- Lecture 10 - Heat-Work Interconversion Devices
- Lecture 11 - Refrigeration / Thermodynamics of mixtures
- Lecture 12 - The Gibbs Duhem equation
- Lecture 13 - Models for Excess Gibbs Free Energy
- Lecture 14 - Van Laar model
- Lecture 15 - Gaseous and liquid mixtures
- Lecture 16 - Separation Work / Equations of state
- Lecture 17 - Chemical potentials in gas and condensed phases
- Lecture 18 - Vapour Liquid Equilibria - I
- Lecture 19 - Vapour Liquid Equilibria - II
- Lecture 20 - Solvent-Solvent mixtures
- Lecture 21 - Solvent-Solute mixtures
- Lecture 22 - Liquid-liquid equilibria
- Lecture 23 - An industrial example
- Lecture 24 - Liquid-liquid equilibria / Reaction Equilibria
- Lecture 25 - Reaction Equilibria
- Lecture 26 - Illustrative Examples - I
- Lecture 27 - Illustrative Examples - II
- Lecture 28 - Illustrative Examples - III
- Lecture 29 - Simultaneous Relations

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- Lecture 30 - Thermodynamic Consistency / Reverse Osmosis
- Lecture 31 - Miscellaneous topics in phase equilibria
- Lecture 32 - Absorption Refrigeration
- Lecture 33 - Summary of Classical Thermodynamics
- Lecture 34 - Molecular basis of Thermodynamics - I
- Lecture 35 - Molecular basis of Thermodynamics - II

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

NPTEL Video Course - Chemical Engineering - Computational Fluid Dynamics

Subject Co-ordinator - Prof. Sreenivas Jayanti

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Motivation for CFD and Introduction to the CFD approach
- Lecture 2 - Illustration of the CFD approach through a worked out example
- Lecture 3 - Eulerian approach, Conservation Equation, Derivation of Mass Conservation Equation and Statement
- Lecture 4 - Forces acting on a control volume; Stress tensor; Derivation of the momentum conservation equation
- Lecture 5 - Kinematics of deformation in fluid flow; Stress vs strain rate relation; Derivation of the Navier-Stokes equation
- Lecture 6 - Equations governing flow of incompressible flow; Initial and boundary conditions; Wellposedness of the problem
- Lecture 7 - Equations for some simple cases; Generic scalar transport equation form of the governing equation
- Lecture 8 - cut out the first 30s; Spatial discretization of a simple flow domain; Taylor's series expansion
- Lecture 9 - Finite difference approximation of pth order of accuracy for qth order derivative; cross-derivatives
- Lecture 10 - One-sided high order accurate approximations; Explicit and implicit formulations for the time derivative
- Lecture 11 - Numerical solution of the unsteady advection equation using different finite difference approximations
- Lecture 12 - Need for analysis of a discretization scheme; Concepts of consistency, stability and convergence
- Lecture 13 - Statement of the stability problem; von Neumann stability analysis of the first order wave equation
- Lecture 14 - Consistency and stability analysis of the unsteady diffusion equation; Analysis for two- and three-dimensional cases
- Lecture 15 - Interpretation of the stability condition; Stability analysis of the generic scalar equation and its extension to the vector case
- Lecture 16 - Template for the generic scalar transport equation and its extension to the solution of Navier-Stokes equations
- Lecture 17 - Illustration of application of the template using the MacCormack scheme for a three-dimensional flow
- Lecture 18 - Stability limits of MacCormack scheme; Limitations in extending compressible flow schemes to incompressible flow
- Lecture 19 - Artificial compressibility method and the streamfunction-vorticity method for the solution of NS equations
- Lecture 20 - Pressure equation method for the solution of NS equations
- Lecture 21 - Pressure-correction approach to the solution of NS equations on a staggered grid; SIMPLE and its variants
- Lecture 22 - Need for efficient solution of linear algebraic equations; Classification of approaches for the solution of linear algebraic equations
- Lecture 23 - Direct methods for linear algebraic equations; Gaussian elimination method
- Lecture 24 - Gauss-Jordan method; LU decomposition method; TDMA and Thomas algorithm
- Lecture 25 - Basic iterative methods for linear algebraic equations
- Lecture 26 - Convergence analysis of basic iterative schemes; Diagonal dominance condition for convergence; ITP
- Lecture 27 - Application to the Laplace equation
- Lecture 28 - Advanced iterative methods
- Lecture 29 - Advanced iterative methods; Strongly Implicit Procedure; Conjugate gradient method; Multigrid method

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- Lecture 30 - Illustration of the Multigrid method for the Laplace equation
- Lecture 31 - Overview of the approach of numerical solution of NS equations for simple domains; Introduction
- Lecture 32 - Derivation of the energy conservation equation
- Lecture 33 - Derivation of the species conservation equation; dealing with chemical reactions
- Lecture 34 - Turbulence; Characteristics of turbulent flow; Dealing with fluctuations and the concept of time
- Lecture 35 - Derivation of the Reynolds -averaged Navier -Stokes equations; identification of the closure problem
- Lecture 36 - Reynolds stresses in turbulent flow; Time and length scales of turbulence; Energy cascade; Mixing
- Lecture 37 - One-equation model for turbulent flow
- Lecture 38 - Two -equation model for turbulent flow; Numerical calculation of turbulent reacting flows
- Lecture 39 - Calculation of near-wall region in turbulent flow; wall function approach; near-wall turbulence
- Lecture 40 - Need for special methods for dealing with irregular flow geometry; Outline of the Body-fitted grid
- Lecture 41 - Transformation of the governing equations; Illustration for the Laplace equation; Appearance and
- Lecture 42 - Finite volume method for complicated flow domain; Illustration for the case of flow through a duct
- Lecture 43 - Finite volume method for the general case
- Lecture 44 - Generation of a structured grid for irregular flow domain; Algebraic methods; Elliptic grid generation
- Lecture 45 - Unstructured grid generation; Domain nodalization; Advancing front method for triangulation
- Lecture 46 - Delaunay triangulation method for unstructured grid generation
- Lecture 47 - Co -located grid approach for irregular geometries; Pressure correction equation for a co -located

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

NPTEL Video Course - Chemical Engineering - Computational Techniques

Subject Co-ordinator - Dr. Niket S. Kaisare

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction
Lecture 2 - Computational and Error Analysis
Lecture 3 - Linear Equations - Part 1
Lecture 4 - Linear Equations - Part 2
Lecture 5 - Linear Equations - Part 3
Lecture 6 - Linear Equations - Part 4
Lecture 7 - Linear Equations - Part 5
Lecture 8 - Linear Equations - Part 6
Lecture 9 - Non Linear Algebraic Equations - Part 1
Lecture 10 - Non Linear Algebraic Equations - Part 2
Lecture 11 - Non Linear Algebraic Equations - Part 3
Lecture 12 - Non Linear Algebraic Equations - Part 4
Lecture 13 - Non Linear Algebraic Equations - Part 5
Lecture 14 - Non Linear Algebraic Equations - Part 6
Lecture 15 - Regression and Interpolation - Part 1
Lecture 16 - Regression and Interpolation - Part 2
Lecture 17 - Regression and Interpolation - Part 3
Lecture 18 - Regression and Interpolation - Part 4
Lecture 19 - Regression and Interpolation - Part 5
Lecture 20 - Differentiation and Integration - Part 1
Lecture 21 - Differentiation and Integration - Part 2
Lecture 22 - Differentiation and Integration - Part 3
Lecture 23 - Differentiation and Integration - Part 4
Lecture 24 - Differentiation and Integration - Part 5
Lecture 25 - Ordinary Differential Equations (initial value problems) - Part 1
Lecture 26 - Ordinary Differential Equations (initial value problems) - Part 2
Lecture 27 - Ordinary Differential Equations (initial value problems) - Part 3
Lecture 28 - Ordinary Differential Equations (initial value problems) - Part 4
Lecture 29 - Ordinary Differential Equations (initial value problems) - Part 5

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- Lecture 30 - Ordinary Differential Equations (initial value problems) - Part 6
- Lecture 31 - Ordinary Differential Equations (initial value problems) - Part 7
- Lecture 32 - Ordinary Differential Equations (initial value problems) - Part 8
- Lecture 33 - Ordinary Differential Equations (initial value problems) - Part 9
- Lecture 34 - Ordinary Differential Equations (boundary value problems) - Part 1
- Lecture 35 - Ordinary Differential Equations (boundary value problems) - Part 2
- Lecture 36 - Ordinary Differential Equations (boundary value problems) - Part 3
- Lecture 37 - Partial Differential Equations - Part 1
- Lecture 38 - Partial Differential Equations - Part 2
- Lecture 39 - Partial Differential Equations - Part 3
- Lecture 40 - Partial Differential Equations - Part 4

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NPTEL Video Course - Chemical Engineering - Particle Characterization (PG)

Subject Co-ordinator - Dr. R. Nagarajan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction
Lecture 2 - Introduction
Lecture 3 - Morphological Characterization
Lecture 4 - Morphological Characterization
Lecture 5 - Morphological Characterization
Lecture 6 - Morphological Characterization
Lecture 7 - Morphological Characterization
Lecture 8 - Morphological Characterization
Lecture 9 - Morphological Characterization
Lecture 10 - Morphological Characterization
Lecture 11 - Morphological Characterization
Lecture 12 - Morphological Characterization
Lecture 13 - Structural Characterization
Lecture 14 - Interfacial Characterization
Lecture 15 - Surface Adhesion
Lecture 16 - Surface Adhesion
Lecture 17 - Surface Adhesion
Lecture 18 - Particle Removal
Lecture 19 - Particle Removal
Lecture 20 - Particle Cohesion
Lecture 21 - Particle Cohesion
Lecture 22 - Transport Properties
Lecture 23 - Transport Properties
Lecture 24 - Transport Properties
Lecture 25 - Transport Properties
Lecture 26 - Chemical & Compositional Characterization
Lecture 27 - Chemical & Compositional Characterization
Lecture 28 - Chemical & Compositional Characterization
Lecture 29 - Nano-particle Characterization

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- Lecture 30 - Nano-particle Characterization
- Lecture 31 - Nano-particle Characterization
- Lecture 32 - Nano-particle Characterization
- Lecture 33 - Practical Relevance of Particle Characterization
- Lecture 34 - Practical Relevance of Particle Characterization
- Lecture 35 - Practical Relevance of Particle Characterization
- Lecture 36 - Practical Relevance of Particle Characterization
- Lecture 37 - Practical Relevance of Particle Characterization
- Lecture 38 - Practical Relevance of Particle Characterization
- Lecture 39 - Practical Relevance of Particle Characterization
- Lecture 40 - Summary

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

NPTEL Video Course - Chemical Engineering - Statistics for Experimentalists

Subject Co-ordinator - Dr. A. Kannan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction
Lecture 2 - Random Variables
Lecture 3 - Discrete Probability Distributions
Lecture 4 - Example Set - I
Lecture 5 - Continuous probability distributions
Lecture 6 - Normal probability distribution
Lecture 7 - Exploratory Data Analysis - Part A
Lecture 8 - Exploratory Data Analysis - Part B
Lecture 9 - Example Set - II
Lecture 10 - Example Set - III
Lecture 11 - Random samples
Lecture 12 - Random samples
Lecture 13 - Point Estimation
Lecture 14 - Sampling distributions and the Central Limit Theorem
Lecture 15 - Example Set - IV Part A
Lecture 16 - Estimation of Population Parameters Using Moments
Lecture 17 - Confidence Intervals (Part A)
Lecture 18 - Confidence Intervals (Part B)
Lecture 19 - The T-distribution
Lecture 20 - Chi-square distribution
Lecture 21 - F-Distribution
Lecture 22 - Example Set - V
Lecture 23 - Hypothesis Testing - Part A
Lecture 24 - Hypothesis Testing - Part B
Lecture 25 - Hypothesis Testing - Part C
Lecture 26 - Analysis of Experiments involving Single Factor - Part A
Lecture 27 - Analysis of Experiments involving Single Factor - Part B
Lecture 28 - Blocking and Randomization
Lecture 29 - Example Set - VI - Part A

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- Lecture 30 - Example Set - VI - Part B
- Lecture 31 - Factorial Design of Experiments - Part A
- Lecture 32 - Factorial Design of Experiments - Part B
- Lecture 33 - Fractional Factorial Design - Part A
- Lecture 34 - Fractional Factorial Design - Part B
- Lecture 35 - Factorial Design of Experiments
- Lecture 36 - Factorial Design of Experiments
- Lecture 37 - Factorial Design of Experiments
- Lecture 38 - Regression Analysis
- Lecture 39 - Regression Analysis
- Lecture 40 - Hypothesis Testing in Linear Regression
- Lecture 41 - Discussion on Regression Output
- Lecture 42 - Regression Analysis
- Lecture 43 - Regression Analysis
- Lecture 44 - Regression Analysis
- Lecture 45 - Orthogonal Model Fitting Concepts - Part A
- Lecture 46 - Orthogonal Model Fitting Concepts - Part B
- Lecture 47 - Experimental Design Strategies - A
- Lecture 48 - Experimental Design Strategies - B
- Lecture 49 - Experimental Design Strategies - C
- Lecture 50 - Response Surface Methodology - A
- Lecture 51 - Response Surface Methodology - B
- Lecture 52 - Optimal Designs - Part A
- Lecture 53 - Optimal Designs - Part B
- Lecture 54 - Statistics for Experimentalists - Summary Part A
- Lecture 55 - Statistics for Experimentalists - Summary Part B

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

NPTEL Video Course - Chemical Engineering - Multiphase Flows - Analytical solutions and Stability Analysis

Subject Co-ordinator - Prof. S. Pushpavanam

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction and overview of the course
- Lecture 2 - Stratified flow in a micro channel
- Lecture 3 - Stratified flow in a micro channel
- Lecture 4 - Flow regimes in microchannels
- Lecture 5 - Scaling Analysis
- Lecture 6 - Scaling Analysis
- Lecture 7 - Interfacial tension and its role in Multiphase flows
- Lecture 8 - Eulerian and Lagrangian approaches
- Lecture 9 - Reynolds Transport Theorem and the Equation of Continuity
- Lecture 10 - Derivation of Navier-Stokes equation
- Lecture 11 - Vector operations in general orthogonal coordinates
- Lecture 12 - Normal and shear stresses on arbitrary surfaces
- Lecture 13 - Normal and shear stresses on arbitrary surfaces
- Lecture 14 - Stresses on deforming surfaces
- Lecture 15 - Pulsatile flow
- Lecture 16 - Pulsatile flow
- Lecture 17 - Pulsatile flow
- Lecture 18 - Viscous heating
- Lecture 19 - Domain perturbation methods
- Lecture 20 - Flow between wavy walls
- Lecture 21 - Introduction to stability of dynamical systems
- Lecture 22 - Stability of distributed systems (PDEs)
- Lecture 23 - Stability of a reaction-diffusion system (Continued...)
- Lecture 24 - Rayleigh-Benard convection
- Lecture 25 - Rayleigh-Benard convection
- Lecture 26 - Rayleigh-Benard convection
- Lecture 27 - Rayleigh-Benard convection
- Lecture 28 - Rayleigh Benard convection
- Lecture 29 - Rayleigh-Taylor \hat{a} heavy over light \hat{a} instability

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- Lecture 30 - Rayleigh-Taylor instability (Continued...)
- Lecture 31 - Capillary jet instability
- Lecture 32 - Capillary jet instability
- Lecture 33 - Capillary jet instability
- Lecture 34 - Tutorial Session
- Lecture 35 - Turing patterns
- Lecture 36 - Turing patterns
- Lecture 37 - Marangoni convection
- Lecture 38 - Marangoni convection
- Lecture 39 - Flow in a circular curved channel
- Lecture 40 - Flow in a circular curved channel
- Lecture 41 - Stability of flow through curved channels
- Lecture 42 - Stability of flow through curved channels
- Lecture 43 - Viscous Fingering
- Lecture 44 - Viscous Fingering
- Lecture 45 - Shallow Cavity flows

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

NPTEL Video Course - Chemical Engineering - NOC:Introduction to Time-Frequency Analysis and Wavelet Transform

Subject Co-ordinator - Dr. Arun K.Tangirala

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction - Lecture 1.1 A
Lecture 2 - Introduction - Lecture 1.1 B
Lecture 3 - Introduction - Lecture 1.2 A
Lecture 4 - Introduction - Lecture 1.2 B
Lecture 5 - Basic Definitions and concepts - Lecture 2.1 (Basic Definitions and concepts - Part I)
Lecture 6 - Basic Definitions and concepts - Lecture 2.2 (Basic Definitions and concepts - Part II)
Lecture 7 - Basic Definitions and concepts - Lecture 2.3 (Basic Definitions and concepts - Part III)
Lecture 8 - A review of Fourier transforms - Lecture 3.1 (Continuous time Fourier series)
Lecture 9 - A review of Fourier transforms - Lecture 3.2 (Continuous time Fourier transform)
Lecture 10 - A review of Fourier transforms - Lecture 3.3 (Discrete time Fourier series)
Lecture 11 - A review of Fourier transforms - Lecture 3.4 (Discrete time Fourier transform)
Lecture 12 - A review of Fourier transforms - Lecture 3.5 (Properties of Fourier transforms)
Lecture 13 - A review of Fourier transforms - Lecture 3.6 (Discrete Fourier transform)
Lecture 14 - A review of Fourier transforms - MATLAB demo of Fourier transform and periodogram
Lecture 15 - Duration and Bandwidth - Duration and Bandwidth
Lecture 16 - Duration and Bandwidth - Bandwidth equation and Instantaneous frequency
Lecture 17 - Duration and Bandwidth - Instantaneous frequency and analytic signals
Lecture 18 - Duration and Bandwidth - Duration-Bandwidth principle
Lecture 19 - Duration and Bandwidth - Requirements of time-frequency analysis techniques
Lecture 20 - Duration and Bandwidth - Requirements of time-frequency analysis and techniques
Lecture 21 - Short-time Fourier transform - Short-time Fourier transform
Lecture 22 - Short-time Fourier transform - Auxillary (MATLAB demonstration)
Lecture 23 - Short-time Fourier transform - Properties of STFT
Lecture 24 - Practical aspects of STFT
Lecture 25 - Closing Remarks
Lecture 26 - Wigner-Ville Distributions
Lecture 27 - Properties of WVD
Lecture 28 - Properties of WVD 2
Lecture 29 - Discrete WVD

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

- Lecture 30 - Pseudo and Smoothed WVD
- Lecture 31 - Cohens class and smoothed WVD
- Lecture 32 - Cohens class and smoothed WVD
- Lecture 33 - Cohens class and Ambiguity functions
- Lecture 34 - Affine class and closing remarks
- Lecture 35 - Continuous Wavelet Transform
- Lecture 36 - Continuous Wavelet Transforms
- Lecture 37 - Scale to Frequency
- Lecture 38 - Computational aspects of CWT
- Lecture 39 - Scalogram and MATLAB demonstration
- Lecture 40 - Scalogram and MATLAB demonstration
- Lecture 41 - Scaling function
- Lecture 42 - Scaling Function
- Lecture 43 - Wavelets
- Lecture 44 - Wavelets
- Lecture 45 - Applications of CWT
- Lecture 46 - Applications of CWT
- Lecture 47 - Discrete Wavelet Transform
- Lecture 48 - Discrete Wavelet Transform.
- Lecture 49 - Orthogonal scaling function bases and MRA
- Lecture 50 - Orthogonal scaling function bases and MRA.
- Lecture 51 - Wavelet Filters and Fast DWT Algorithm
- Lecture 52 - Wavelet Filters and Fast DWT Algorithm (Continued...)
- Lecture 53 - Wavelet Filters and Fast DWT Algorithm (Continued...)
- Lecture 54 - Wavelets for DWT
- Lecture 55 - Wavelets for DWT (Continued...)
- Lecture 56 - Wavelets for DWT (Continued...)
- Lecture 57 - DWT computation
- Lecture 58 - DWT computation (Continued...)
- Lecture 59 - DWT computation (Continued...)

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

NPTEL Video Course - Chemical Engineering - Chemical Engineering Principles of CVD Processes

Subject Co-ordinator - Dr. R. Nagarajan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction
- Lecture 2 - CVD Reactor and Process Design Fundamentals
- Lecture 3 - Overview of CVD Process Fundamentals
- Lecture 4 - Basics of Chemical Equilibrium Calculations and Flow Dynamics
- Lecture 5 - Introduction to CVD Films
- Lecture 6 - Film Structure and Properties
- Lecture 7 - Pressure Effects on CVD Processes
- Lecture 8 - CVD of Metals
- Lecture 9 - CVD of Coatings
- Lecture 10 - CVD Film Property Measurements
- Lecture 11 - CVD Film Property Measurements
- Lecture 12 - CVD in Tungsten Filament Lamps
- Lecture 13 - CVD in Tungsten Filament Lamps
- Lecture 14 - CVD in Hot Corrosion
- Lecture 15 - CVD Transport Phenomena
- Lecture 16 - CVD Transport Phenomena
- Lecture 17 - CVD Transport Phenomena
- Lecture 18 - CVD Transport Phenomena
- Lecture 19 - CVD Transport Phenomena
- Lecture 20 - CVD Applications
- Lecture 21 - CVD Applications
- Lecture 22 - CVD Applications
- Lecture 23 - CVD Applications
- Lecture 24 - CVD Applications
- Lecture 25 - CVD Overview
- Lecture 26 - Review of CVD Basics
- Lecture 27 - Review of CVD Basics
- Lecture 28 - CVD Question Bank
- Lecture 29 - Basics of Nano-Structured Material Synthesis

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

- Lecture 30 - Basics of Nano-Structured Material Synthesis
- Lecture 31 - Undesirable CVD
- Lecture 32 - Undesirable CVD
- Lecture 33 - Undesirable CVD
- Lecture 34 - Multi-component Transport Fundamentals
- Lecture 35 - Multi-component Transport Fundamentals
- Lecture 36 - Multi-component Transport Fundamentals
- Lecture 37 - Multi-component Transport Fundamentals
- Lecture 38 - Multi-component Transport Fundamentals
- Lecture 39 - Multi-component Transport Fundamentals

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

NPTEL Video Course - Chemical Engineering - Chemical Reaction Engineering 1 (Homogeneous Reactors)

Subject Co-ordinator - Prof K. Krishnaiah

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Motivation and Introduction - Part I
Lecture 2 - Motivation and Introduction - Part II
Lecture 3 - What is Chemical Engineering - Part I
Lecture 4 - What is Chemical Engineering - Part II
Lecture 5 - What is Chemical Reaction Engineering - Part I
Lecture 6 - What is Chemical Reaction Engineering - Part II
Lecture 7 - Homogeneous and Heterogeneous Reactions - Part I
Lecture 8 - Homogeneous and Heterogeneous Reactions - Part II
Lecture 9 - Basics of Kinetics and Contacting
Lecture 10 - Design of Batch reactors - Part I
Lecture 11 - Design of Batch reactors - Part II
Lecture 12 - Basics of Plug Flow Reactor - Part I
Lecture 13 - Basics of Plug Flow Reactor - Part II
Lecture 14 - Design of Plug Flow Reactors - Part I
Lecture 15 - Design of Plug Flow Reactors - Part II
Lecture 16 - Basics of Mixed Flow Reactors
Lecture 17 - Design of Mixed Flow Reactors
Lecture 18 - Basics of Kinetics
Lecture 19 - Kinetics of Heterogeneous reactions - Part I
Lecture 20 - Kinetics of Heterogeneous reactions - Part II
Lecture 21 - Kinetics of Heterogeneous reactions - Part III
Lecture 22 - Kinetics of Homogeneous reactions
Lecture 23 - Reaction rate for Homogeneous reactions
Lecture 24 - Gas Phase Homogeneous reactions
Lecture 25 - (Continued...) And later Reactor Design of PFR
Lecture 26 - Reactor Design for MFR and Combination of reactors
Lecture 27 - PFR and MFR in series.
Lecture 28 - Unsteady state MFR and PFR
Lecture 29 - Recycle Reactors

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

- Lecture 30 - Recycle Reactors (Autocatalytic reactions) - Part I
- Lecture 31 - Recycle Reactors (Autocatalytic reactions) - Part II
- Lecture 32 - Multiple Reactions - Part I
- Lecture 33 - Multiple Reactions - Part II
- Lecture 34 - Multiple Reactions - Part III
- Lecture 35 - Multiple Reactions - Part IV
- Lecture 36 - Multiple Reactions - Part V
- Lecture 37 - Multiple Reactions - Part VI
- Lecture 38 - Non-Isothermal Reactors - Part I
- Lecture 39 - Non-Isothermal Reactors - Part II
- Lecture 40 - Non-Isothermal Reactors (Graphical Design)
- Lecture 41 - Non-Isothermal Reactors contd. & Adiabatic Reactors
- Lecture 42 - Non-Isothermal Reactors (Graphical Design) (Continued...)
- Lecture 43 - Non-Isothermal Batch Reactors
- Lecture 44 - Non-isothermal Plug Flow Reactors - Part I
- Lecture 45 - Non-isothermal Plug Flow Reactors - Part II
- Lecture 46 - Adiabatic Plug Flow Reactors
- Lecture 47 - Non-isothermal Mixed Flow Reactors
- Lecture 48 - Non-isothermal Mixed Flow Reactors (Continued...) (Multiple steady states) - Part I
- Lecture 49 - Non-isothermal Mixed Flow Reactors (Continued...) (Multiple steady states) - Part II
- Lecture 50 - Non-Ideal Flow and Residence Time Distributions (RTD) basics - Part I
- Lecture 51 - Non-Ideal Flow and Residence Time Distributions (RTD) basics - Part II
- Lecture 52 - RTD for various reactors (Continued...) Part I
- Lecture 53 - RTD for various reactors (Continued...) Part II
- Lecture 54 - Diagnosing the ills of equipments and Various RTD Models
- Lecture 55 - Dispersion Model
- Lecture 56 - Dispersion with reaction Model and Tanks in Series Model
- Lecture 57 - Multi-parameter model (MFR with dead space and bypass)
- Lecture 58 - Direct use of RTD to predict conversion (Macro and Micro-fluid as well as Macro & Micro-mixing C
- Lecture 59 - Direct use of RTD to predict conversion (Macro and Micro-fluid as well as Macro & Micro-mixing C
- Lecture 60 - Direct use of RTD to predict conversion (Macro and Micro-fluid as well as Macro & Micro-mixing C

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

NPTEL Video Course - Chemical Engineering - Chemical Reaction Engineering 2 (Heterogeneous Reactors)

Subject Co-ordinator - Prof K. Krishnaiah

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to Kinetics (Gas solid non-catalytic reaction)
- Lecture 2 - Intro to Kinetics (Continued...) for catalytic reactions in different reactors
- Lecture 3 - Heterogeneous rate of reactions and different types of kinetic models for non-catalytic reactions
- Lecture 4 - Basics of Kinetics of type A & B reactions (Shrinking core model & Porous particle homogeneous model)
- Lecture 5 - Shrinking Core Model (Continued...)
- Lecture 6 - Shrinking Core Model (Continued...)
- Lecture 7 - (Continued...) & Proof of Pseudo steady state assumption
- Lecture 8 - Shrinking core model (Continued...) for type D reactions
- Lecture 9 - Shrinking core model (Continued...) for type D reactions (Continued...)
- Lecture 10 - Reactors, Homogeneous reaction model, Design of non-catalytic gas solid reactors
- Lecture 11 - Design of non-catalytic gas solid reactors (Continued...)
- Lecture 12 - Design of non-catalytic gas solid reactors (Continued...)
- Lecture 13 - Design equation for MF of solids, uniform gas composition, const. single particle size, Shrinking core model
- Lecture 14 - Design equation for MF of solids, mixture of particles for different sizes but unchanging size, Shrinking core model
- Lecture 15 - Design equation for MF of solids with elutriation, mixture of particles of different size, uniform gas composition
- Lecture 16 - General Performance equation for non-catalytic gas solid reactions
- Lecture 17 - Catalytic reactions (LHHW Kinetic model)
- Lecture 18 - LHHW Kinetic model (Continued...) - Part I
- Lecture 19 - LHHW Kinetic model (Continued...) - Part II
- Lecture 20 - Industrially important catalytic reaction models
- Lecture 21 - Inter and Intraphase effectiveness factor
- Lecture 22 - Interface effectiveness factor & Generalized nonisothermal effectiveness factor for external mass transfer
- Lecture 23 - Generalized nonisothermal effectiveness factor for external mass transfer step (Continued...)
- Lecture 24 - Mass transfer correlations for various reactors
- Lecture 25 - Isothermal intraphase effectiveness factor - Part I
- Lecture 26 - Isothermal intraphase effectiveness factor - Part II
- Lecture 27 - Non-isothermal intraphase effectiveness factor
- Lecture 28 - Inter and Intraphase effectiveness factor (Continued...)
- Lecture 29 - Inter and Intraphase Mass transfer

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- Lecture 30 - Packed (fixed) bed catalytic reactor design
- Lecture 31 - Graphical design of Fixed bed reactors
- Lecture 32 - Packed Bed Design (Continued...)
- Lecture 33 - Design equations for Packed bed reactor design
- Lecture 34 - Conservative Equations for Packed bed Reactor design
- Lecture 35 - Problem solving session
- Lecture 36 - Fluidized Bed Reactor Design - Part I
- Lecture 37 - Fluidized Bed Reactor Design - Part II
- Lecture 38 - Fluidized Bed Reactor Design - Part III
- Lecture 39 - Fluidized Bed Reactor Design - Part IV
- Lecture 40 - Continued... (Fluidized bed reactor Models)
- Lecture 41 - Continued... (Davidson Harrison model and Kunii Levenspiel model)
- Lecture 42 - Continued... (Kunii Levenspiel Model)
- Lecture 43 - Slurry Reactor Design

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

NPTEL Video Course - Chemical Engineering - NOC:MATLAB Programming for Numerical Computation

Subject Co-ordinator - Dr. Niket S.Kaisare

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Course Introduction
- Lecture 2 - Basics of Programming using MATLAB
- Lecture 3 - Array Operations in MATLAB
- Lecture 4 - Loops and Execution Control
- Lecture 5 - Tutorial
- Lecture 6 - MATLAB Files -- Scripts and Functions
- Lecture 7 - Plotting and Output
- Lecture 8 - How to submit MATLAB Assignment
- Lecture 9 - Errors in Numerical Computation
- Lecture 10 - Truncation Errors and Taylors Series
- Lecture 11 - Round-Off Errors; and Iterative Methods
- Lecture 12 - Step-wise Methods and Error Propagation
- Lecture 13 - How to get MATLAB Online access (for all enrolled students of this course)
- Lecture 14 - Differentiation in Single Variable
- Lecture 15 - Higher Order Differentiation Formulae
- Lecture 16 - Partial Differentials (Bonus)
- Lecture 17 - Numerical Integration
- Lecture 18 - Multiple Applications of Integration Formulae
- Lecture 19 - In-Build MATLAB Integration Functions
- Lecture 20 - Basics of Linear Algebra
- Lecture 21 - Gauss Elimination and Back-Substitution
- Lecture 22 - LU Decomposition and Partial Pivoting
- Lecture 23 - Gauss Siedel Method
- Lecture 24 - (Tutorial)
- Lecture 25 - Tri-Diagonal Matrix Algorithm
- Lecture 26 - Nonlinear Equations in Single Variable
- Lecture 27 - Using MATLAB command fzero
- Lecture 28 - Fixed Point Iteration in Single Variable
- Lecture 29 - Newton-Raphson (single variable)

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- Lecture 30 - Using MATLAB command fsolve (multi-variable)
- Lecture 31 - Newton-Raphson (multi Variable)
- Lecture 32 - Introduction
- Lecture 33 - Linear Least Squares Regression
- Lecture 34 - Nonlinear and Functional Regression
- Lecture 35 - Interpolation Functions in MATLAB
- Lecture 36 - Introduction and Euler\'s Method
- Lecture 37 - Runge-Kutta (RK-2) method
- Lecture 38 - MATLAB ode45 algorithm
- Lecture 39 - Higher order Runge-Kutta Methods
- Lecture 40 - Error Analysis
- Lecture 41 - Multi-Variable ODE
- Lecture 42 - Stiff Systems & Solution using ode15s
- Lecture 43 - Method of Lines for transient PDEs
- Lecture 44 - A Final Example
- Lecture 45 - Tutorial

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

NPTEL Video Course - Chemical Engineering - NOC:Computational Fluid Dynamics

Subject Co-ordinator - Prof. Sreenivas Jayanti

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Motivation
- Lecture 2 - Flow in a rectangular duct
- Lecture 3 - Flow in a rectangular duct
- Lecture 4 - Tutorial 1
- Lecture 5 - Tutorial 1 (Continued...) Solution for algebraic equations using Gauss- Seidel Method
- Lecture 6 - Flow in a triangular duct
- Lecture 7 - Flow in a triangular duct
- Lecture 8 - Tutorial 2
- Lecture 9 - Tutorial 2 (Continued...) Description of FV method and solution using G-S Method
- Lecture 10 - Effect of grid spacing & upcoming course outline
- Lecture 11 - Mass conservation equations
- Lecture 12 - Momentum conservation equations
- Lecture 13 - Forces acting on control volume
- Lecture 14 - Kinematics of deformation in fluid flow
- Lecture 15 - Equations governing fluid flow in incompressible fluid
- Lecture 16 - Navier-Stokes equation for simple cases of flow
- Lecture 17 - Energy conservation equations
- Lecture 18 - Practical cases of fluid flow with heat transfer in CFD point of view
- Lecture 19 - Practical cases of fluid flow with mass transfer in CFD point of view
- Lecture 20 - Equations governing fluid flow with chemical reactions
- Lecture 21 - Concept of wellposedness of mathematical problems
- Lecture 22 - Introduction to finite difference methods
- Lecture 23 - Finite difference approximation on an uniform mesh
- Lecture 24 - Higher order and mixed derivatives
- Lecture 25 - Solution of Poisson equation in rectangular duct-Tutorial
- Lecture 26 - Discretization of time domain
- Lecture 27 - FD approx. on a non-uniform mesh and need of analysis of obtained discretization
- Lecture 28 - Need for the analysis of discretized equation
- Lecture 29 - Properties of Numerical Schemes

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- Lecture 30 - Properties of Numerical Schemes
- Lecture 31 - Tutorial on Stability Analysis
- Lecture 32 - Analysis of Generic 1-d scalar transport equation
- Lecture 33 - Introduction to the solution of coupled N-S equations
- Lecture 34 - N-S equation in compressible flow- Mac Cormack Scheme
- Lecture 35 - Stability limits of Mac-Cormack Scheme and the intro to Beam-Warming Scheme
- Lecture 36 - Implicit Beam-Warming Scheme
- Lecture 37 - Compressible flow to Incompressible flow
- Lecture 38 - Solution of coupled equations
- Lecture 39 - Artificial compressibility method, Stream function-vorticity method
- Lecture 40 - Pressure equation method, Staggered grid system
- Lecture 41 - Pressure Correction Method
- Lecture 42 - Tutorial on Pressure Correction Method
- Lecture 43 - Tutorial on Pressure Correction Method (Continued...)
- Lecture 44 - Introduction to the basic numerical methods
- Lecture 45 - Direct Methods
- Lecture 46 - Tri-diagonal Matrix Algorithm
- Lecture 47 - TDMA and other iterative methods
- Lecture 48 - Recap of basic iterative methods.
- Lecture 49 - Convergence analysis of basic iterative methods
- Lecture 50 - Successive Over Relaxation (SOR) method
- Lecture 51 - Alternating Direction Implicit (ADI) method
- Lecture 52 - Strongly Implicit Procedure (ILU) method
- Lecture 53 - Multigrid method
- Lecture 54 - Body Fitted Grid Approach
- Lecture 55 - Formulation Of Finite Volume Method
- Lecture 56 - Methods For Unstructured Grid Generation
- Lecture 57 - Triangulation
- Lecture 58 - The Advancing Front Method continuation
- Lecture 59 - Time and length scale of turbulence
- Lecture 60 - The turbulent closure problem
- Lecture 61 - The generic formulation for turbulence
- Lecture 62 - More generic formulation and summary

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

NPTEL Video Course - Chemical Engineering - NOC:Introduction to Statistical Hypothesis Testing

Subject Co-ordinator - Dr. Arun K.Tangirala

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Motivation
- Lecture 2 - Probability and statistics
- Lecture 3 - Probability and Statistics
- Lecture 4 - R Tutorial 1
- Lecture 5 - Statistics for Hypothesis Testing - Part 1
- Lecture 6 - Statistics for Hypothesis Testing - Part 2
- Lecture 7 - Statistics for sample mean
- Lecture 8 - Statistics for Variance and Proportion
- Lecture 9 - Type I and Type II errors
- Lecture 10 - p value
- Lecture 11 - Hypothesis testing of means
- Lecture 12 - Hypothesis testing of variance and proportions
- Lecture 13 - Confidence interval construction
- Lecture 14 - Hypothesis testing using confidence interval
- Lecture 15 - Hypothesis testing of correlation
- Lecture 16 - Statistic for linear regression
- Lecture 17 - Hypothesis testing in linear regression
- Lecture 18 - Power of hypothesis test
- Lecture 19 - Factors affecting hypothesis test

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

NPTEL Video Course - Chemical Engineering - NOC:Applied Time-Series Analysis

Subject Co-ordinator - Dr. Arun K.Tangirala

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Lecture 1 - Part 1 - Motivation and Overview 1
Lecture 2 - Lecture 1 - Part 2 - Motivation and Overview 2
Lecture 3 - Lecture 2 - Part 1 - Motivation and Overview 3
Lecture 4 - Lecture 2 - Part 2 - Motivation and Overview 4
Lecture 5 - Lecture 3 - Part 1 - Motivation and Overview 5
Lecture 6 - Lecture 3 - Part 2 - Motivation and Overview 6
Lecture 7 - Lecture 4 - Part 1 - Probability and Statistics Review 1A
Lecture 8 - Lecture 4 - Part 2 - Probability and Statistics Review 1B
Lecture 9 - Lecture 5 - Part 1 - Probability and Statistics Review 1C
Lecture 10 - Lecture 5 - Part 2 - Probability and Statistics Review 1D
Lecture 11 - Lecture 6 - Part 1 - Probability and Statistics Review 2A
Lecture 12 - Lecture 6 - Part 2 - Probability and Statistics Review 2B
Lecture 13 - Lecture 6 - Part 3 - Probability and Statistics Review 2C
Lecture 14 - Lecture 7 - Part 1 - Probability and Statistics Review 2D
Lecture 15 - Lecture 7 - Part 2 - Probability and Statistics Review 2E
Lecture 16 - Lecture 7 - Part 3 - Probability and Statistics Review 2F
Lecture 17 - Lecture 8 - Part 1 - Probability and Statistics Review 2G (with R Demonstration)
Lecture 18 - Lecture 8 - Part 2 - Probability and Statistics Review 2H (with R Demonstration)
Lecture 19 - Lecture 9 - Part 1 - Probability and Statistics Review 2I
Lecture 20 - Lecture 9 - Part 2 - Probability and Statistics Review 2J
Lecture 21 - Lecture 9 - Part 3 - Introduction to Random Processes 1
Lecture 22 - Lecture 10 - Part 1 - Introduction to Random Processes 2
Lecture 23 - Lecture 10 - Part 2 - Introduction to Random Processes 3
Lecture 24 - Lecture 11 - Part 1 - Introduction to Random Processes 4
Lecture 25 - Lecture 11 - Part 2 - Introduction to Random Processes 5
Lecture 26 - Lecture 11 - Part 3 - Autocovariance & Autocorrelation Functions 1
Lecture 27 - Lecture 12 - Part 1 - Autocovariance & Autocorrelation Functions 2
Lecture 28 - Lecture 12 - Part 2 - Autocovariance & Autocorrelation Functions 3
Lecture 29 - Lecture 13 - Part 1 - Autocovariance & Autocorrelation Functions 4

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Lecture 30	-	Lecture 13	-	Part 2	-	Autocovariance & Autocorrelation Functions	5
Lecture 31	-	Lecture 13	-	Part 3	-	Autocovariance & Autocorrelation Functions	6
Lecture 32	-	Lecture 14	-	Part 1	-	Autocovariance & Autocorrelation Functions	7
Lecture 33	-	Lecture 14	-	Part 2	-	Autocovariance & Autocorrelation Functions	8
Lecture 34	-	Lecture 15	-	Part 1	-	Autocovariance & Autocorrelation Functions	9
Lecture 35	-	Lecture 15	-	Part 2	-	Partial Autocorrelation Functions	
Lecture 36	-	Lecture 16	-	Part 1	-	Autocorrelation and Partial-autocorrelation Functions (with R Demonstrations)	
Lecture 37	-	Lecture 16	-	Part 2	-	Models for Linear Stationary Processes	1
Lecture 38	-	Lecture 17	-	Part 1	-	Models for Linear Stationary Processes	2
Lecture 39	-	Lecture 17	-	Part 2	-	Models for Linear Stationary Processes	3
Lecture 40	-	Lecture 18	-	Part 1	-	Models for Linear Stationary Processes	4
Lecture 41	-	Lecture 18	-	Part 2	-	Models for Linear Stationary Processes	5
Lecture 42	-	Lecture 18	-	Part 3	-	Models for Linear Stationary Processes	6
Lecture 43	-	Lecture 19	-	Part 1	-	Models for Linear Stationary Processes	7
Lecture 44	-	Lecture 19	-	Part 2	-	Models for Linear Stationary Processes	8
Lecture 45	-	Lecture 19	-	Part 3	-	Models for Linear Stationary Processes	9
Lecture 46	-	Lecture 20	-	Part 1	-	Models for Linear Stationary Processes	10
Lecture 47	-	Lecture 20	-	Part 2	-	Models for Linear Stationary Processes	11
Lecture 48	-	Lecture 21	-	Part 1	-	Models for Linear Stationary Processes	12
Lecture 49	-	Lecture 21	-	Part 2	-	Models for Linear Stationary Processes	13
Lecture 50	-	Lecture 22	-	Part 1	-	Models for Linear Stationary Processes	14 (with R Demonstrations)
Lecture 51	-	Lecture 22	-	Part 2	-	Models for Linear Stationary Processes	15 (with R Demonstrations)
Lecture 52	-	Lecture 22	-	Part 3	-	Models for Linear Stationary Processes	16 (with R Demonstrations)
Lecture 53	-	Lecture 23	-	Part 1	-	Models for Linear Non-stationary Processes	1
Lecture 54	-	Lecture 23	-	Part 2	-	Models for Linear Non-stationary Processes	2 (with R Demonstrations)
Lecture 55	-	Lecture 24	-	Part 1	-	Models for Linear Non-stationary Processes	3 (with R Demonstrations)
Lecture 56	-	Lecture 24	-	Part 2	-	Models for Linear Non-stationary Processes	4
Lecture 57	-	Lecture 25	-	Part 1	-	Models for Linear Non-stationary Processes	5
Lecture 58	-	Lecture 25	-	Part 2	-	Models for Linear Non-stationary Processes	6 (with R Demonstrations)
Lecture 59	-	Lecture 26	-	Part 1	-	Fourier Transforms for Deterministic Signals	1
Lecture 60	-	Lecture 26	-	Part 2	-	Fourier Transforms for Deterministic Signals	2
Lecture 61	-	Lecture 27	-	Part 1	-	Fourier Transforms for Deterministic Signals	3
Lecture 62	-	Lecture 27	-	Part 2	-	Fourier Transforms for Deterministic Signals	4
Lecture 63	-	Lecture 28	-	Part 1	-	Fourier Transforms for Deterministic Signals	5
Lecture 64	-	Lecture 28	-	Part 2	-	Fourier Transforms for Deterministic Signals	6
Lecture 65	-	Lecture 29	-	Part 1	-	Fourier Transforms for Deterministic Signals	7
Lecture 66	-	Lecture 29	-	Part 2	-	Fourier Transforms for Deterministic Signals	8
Lecture 67	-	Lecture 30	-	Part 1	-	Fourier Transforms for Deterministic Signals	9
Lecture 68	-	Lecture 30	-	Part 2	-	DFT and Periodogram	1

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Lecture 69 - Lecture 31 - Part 1 - DFT and Periodogram 2
Lecture 70 - Lecture 31 - Part 2 - DFT and Periodogram 3 (with R Demonstrations)
Lecture 71 - Lecture 32 - Part 1 - Spectral Representations of Random Processes 1
Lecture 72 - Lecture 32 - Part 2 - Spectral Representations of Random Processes 2
Lecture 73 - Lecture 33 - Part 1 - Spectral Representations of Random Processes 3
Lecture 74 - Lecture 33 - Part 2 - Spectral Representations of Random Processes 4
Lecture 75 - Lecture 33 - Part 3 - Spectral Representations of Random Processes 5
Lecture 76 - Lecture 34 - Part 1 - Spectral Representations of Random Processes 6
Lecture 77 - Lecture 34 - Part 2 - Spectral Representations of Random Processes 7
Lecture 78 - Lecture 35 - Part 1 - Introduction to Estimation Theory 1
Lecture 79 - Lecture 35 - Part 2 - Introduction to Estimation Theory 2
Lecture 80 - Lecture 35 - Part 3 - Introduction to Estimation Theory 3
Lecture 81 - Lecture 36A - Introduction to Estimation Theory -4
Lecture 82 - Lecture 36B - Goodness of Estimators 1 - 1
Lecture 83 - Lecture 37A - Goodness of Estimators 1 - 2
Lecture 84 - Lecture 37B - Goodness of Estimators 1 - 3
Lecture 85 - Lecture 37C - Goodness of Estimators 1 - 4
Lecture 86 - Lecture 38A - Goodness of Estimators 2 - 1
Lecture 87 - Lecture 38B - Goodness of Estimators 2 - 2
Lecture 88 - Lecture 38C - Goodness of Estimators 2 - 3
Lecture 89 - Lecture 39A - Goodness of Estimators 2 - 4
Lecture 90 - Lecture 39B - Goodness of Estimators 2 - 5 (with R demonstrations)
Lecture 91 - Lecture 39C - Goodness of Estimators 2 - 6
Lecture 92 - Lecture 40A - Goodness of Estimators 2 - 7
Lecture 93 - Lecture 40B - Goodness of Estimators 2 - 8
Lecture 94 - Lecture 41A - Estimation Methods 1 - 1
Lecture 95 - Lecture 41B - Estimation Methods 1 - 2
Lecture 96 - Lecture 42A - Estimation Methods 1 - 3
Lecture 97 - Lecture 42B - Estimation Methods 1 - 4
Lecture 98 - Lecture 42C - Estimation Methods 1 - 5
Lecture 99 - Lecture 43A - Estimation Methods 1 - 6 (with R demonstrations)
Lecture 100 - Lecture 43B - Estimation Methods 1 - 7 (with R demonstrations)
Lecture 101 - Lecture 44A - Estimation Methods 1 - 8
Lecture 102 - Lecture 44B - Estimation Methods 1 - 9
Lecture 103 - Lecture 44C - Estimation Methods 2 - 1
Lecture 104 - Lecture 45A - Estimation Methods 2 - 2
Lecture 105 - Lecture 45B - Estimation Methods 2 - 3
Lecture 106 - Lecture 46A - MLE and Bayesian Estimation - 1
Lecture 107 - Lecture 46B - MLE and Bayesian Estimation - 2

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Lecture 108 - Lecture 47A - MLE and Bayesian Estimation - 3
Lecture 109 - Lecture 47B - MLE and Bayesian Estimation - 4
Lecture 110 - Lecture 48A - Estimation of Time Domain Statistics - 1
Lecture 111 - Lecture 48B - Estimation of Time Domain Statistics - 2
Lecture 112 - Lecture 49 - Periodogram as PSD Estimator

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

NPTEL Video Course - Chemical Engineering - NOC:Rheology of Complex Materials

Subject Co-ordinator - Dr. Abhijit P. Deshpande

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Flow phenomena in complex materials and Microstructure - 1
Lecture 2 - Flow phenomena in complex materials and Microstructure - 2
Lecture 3 - Applications of rheology
Lecture 4 - Applications of rheology
Lecture 5 - Applications of rheology
Lecture 6 - Applications of rheology
Lecture 7 - Stress and strain rate - 1
Lecture 8 - Stress and strain rate - 2
Lecture 9 - Velocity gradient and strain rate - 1
Lecture 10 - Velocity gradient and strain rate 1 Stress and strain rate - 3
Lecture 11 - Kinematics for simple flows - 1
Lecture 12 - Kinematics for simple flows - 2
Lecture 13 - Introduction to tensors
Lecture 14 - Rheometric flows
Lecture 15 - Viscous response - 1
Lecture 16 - Viscous response - 2
Lecture 17 - Viscoelasticity - Relaxation process
Lecture 18 - Viscoelasticity - Maxwell model
Lecture 19 - Linear viscoelasticity - oscillatory shear - 1
Lecture 20 - Linear viscoelasticity - oscillatory shear - 2
Lecture 21 - Introduction to tensors - 2
Lecture 22 - Introduction to tensors - 3
Lecture 23 - Rheometers - 1
Lecture 24 - Rheometers - 2
Lecture 25 - Rheometers - 3
Lecture 26 - Rheometers - 4
Lecture 27 - Rheometers - 5
Lecture 28 - Governing equations for rheology - 1
Lecture 29 - Governing equations for rheology - 2

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NPTTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

- Lecture 30 - Relaxation time spectrum - 1
- Lecture 31 - Relaxation time spectrum - 2
- Lecture 32 - Linear viscoelasticity
- Lecture 33 - Time temperature superposition
- Lecture 34 - Linear viscoelasticity
- Lecture 35 - General linear viscoelasticity
- Lecture 36 - Rotational rheometry
- Lecture 37 - Review of material functions - 1
- Lecture 38 - Review of material functions - 2
- Lecture 39 - Survey of material functions for polymers - 1
- Lecture 40 - Survey of material functions for polymers - 2
- Lecture 41 - Survey of material functions for polymers - 3
- Lecture 42 - Survey of material functions for polymers - 4
- Lecture 43 - Survey of material functions for multiphase systems - 1
- Lecture 44 - Strain and convected rate - 1
- Lecture 45 - Strain and convected rate - 2
- Lecture 46 - Strain and convected rate - 3
- Lecture 47 - Strain and convected rate - 4
- Lecture 48 - Normal stresses - 1
- Lecture 49 - Normal stresses - 2
- Lecture 50 - Structured materials - yield stress
- Lecture 51 - Yield stress and thixotropic materials
- Lecture 52 - Normal stresses and stress growth
- Lecture 53 - Rheometer demonstration
- Lecture 54 - Review of material functions - 3
- Lecture 55 - Survey of material functions for multiphase macromolecular systems
- Lecture 56 - Problems during rheometry - example of cone and plate - 1
- Lecture 57 - Problems during rheometry - example of cone and plate - 2
- Lecture 58 - Strain, convected derivatives, non-linear models - 1
- Lecture 59 - Strain, convected derivatives, non-linear models - 2
- Lecture 60 - Rheometer demonstration
- Lecture 61 - Microscopic modeling of rheology - 1
- Lecture 62 - Microscopic modeling of rheology - 2
- Lecture 63 - Live Session

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

NPTEL Video Course - Chemical Engineering - NOC:Process Control - Design, Analysis and Assessment

Subject Co-ordinator - Prof. Ragunathan Rengasamy

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction
Lecture 2 - Introductory Concepts
Lecture 3 - Introduction to Modeling
Lecture 4 - Introduction to Control Structures
Lecture 5 - Process Modelling
Lecture 6 - State Space Modeling
Lecture 7 - State Space Solution
Lecture 8 - Laplace Transforms - Part 1
Lecture 9 - Laplace Transforms - Part 2
Lecture 10 - Analysis of transfer function models - Part 1
Lecture 11 - Analysis of transfer function models - Part 2
Lecture 12 - Stability
Lecture 13 - MATLAB Tutorial 1
Lecture 14 - MATLAB Tutorial 2
Lecture 15 - Controller Equations
Lecture 16 - Controllers and analysis of closed loop transfer functions
Lecture 17 - P, PI and PID Controllers
Lecture 18 - Stability analysis of closed loop systems
Lecture 19 - Controller design and tuning - Part 1
Lecture 20 - Controller design and tuning - Part 2
Lecture 21 - Traditional Advanced Control - Part 1
Lecture 22 - Traditional Advanced Control - Part 2
Lecture 23 - Frequency Response Analysis - Part 1
Lecture 24 - Frequency Response Analysis - Part 2
Lecture 25 - Traditional Advanced Control - Part 3
Lecture 26 - Traditional Advanced Control - Part 4
Lecture 27 - Traditional Advanced Control - Part 5
Lecture 28 - Understanding PID Gains
Lecture 29 - Nyquist Stability Criterion - Part 1

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- Lecture 30 - Nyquist Stability Criterion - Part 2
- Lecture 31 - Nyquist Stability Criterion - Part 3
- Lecture 32 - Controllers for Unstable Systems
- Lecture 33 - Traditional Advanced Control - Part 6
- Lecture 34 - Traditional Advanced Control - Part 7
- Lecture 35 - Multivariable Control - Part 1
- Lecture 36 - Multivariable Control - Part 2
- Lecture 37 - Model Predictive Control - Part 1
- Lecture 38 - Model Predictive Control - Part 2
- Lecture 39 - Model Predictive Control-Mathematical Formulation - Part 1
- Lecture 40 - Model Predictive Control-Mathematical Formulation - Part 2
- Lecture 41 - Model Predictive Control - Discrete Model
- Lecture 42 - Model Predictive Control - Putting all these together
- Lecture 43 - Stability Analysis-Variou methods - Part 1
- Lecture 44 - Stability Analysis-Variou methods - Part 2
- Lecture 45 - Stability Analysis-Variou methods - Part 3
- Lecture 46 - PID Tuning
- Lecture 47 - MATLAB Tutorial-Controller Tuning - Part 1
- Lecture 48 - MATLAB Tutorial-Controller Tuning - Part 2
- Lecture 49 - MATLAB Tutorial - Controller Design - Part 1
- Lecture 50 - MATLAB Tutorial - Controller Design - Part 2
- Lecture 51 - MATLAB Tutorial - Controller Design - Part 3
- Lecture 52 - Conclusion Lecture

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

NPTEL Video Course - Chemical Engineering - System Identification

Subject Co-ordinator - Dr. Arun K.Tangirala

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Motivation and Overview 1
Lecture 2 - Motivation and Overview 2
Lecture 3 - Motivation and Overview 3
Lecture 4 - Motivation and Overview 4
Lecture 5 - Journey into Identification 1
Lecture 6 - Journey into Identification 2
Lecture 7 - Journey into Identification 3
Lecture 8 - Journey into Identification (Case Studies) 4
Lecture 9 - Journey into Identification (Case Studies) 5
Lecture 10 - Journey into Identification (Case Studies) 6
Lecture 11 - Journey into Identification (Case Studies) 7
Lecture 12 - Journey into Identification (Case Studies) 8
Lecture 13 - Journey into Identification (Case Studies) 9
Lecture 14 - Journey into Identification (Case Studies) 10
Lecture 15 - Journey into Identification (Case Studies) 11
Lecture 16 - Journey into Identification (Case Studies) 12
Lecture 17 - Journey into Identification (Case Studies) 13
Lecture 18 - Journey into Identification (Case Studies) 14
Lecture 19 - Journey into Identification (Case Studies) 15
Lecture 20 - Journey into Identification (Case Studies) 16
Lecture 21 - Journey into Identification 17
Lecture 22 - Journey into Identification 18
Lecture 23 - Response-based Description 1
Lecture 24 - Response-based Description 2
Lecture 25 - Response-based Description 3
Lecture 26 - Response-based Description 4
Lecture 27 - Response-based Description 5
Lecture 28 - Response-based Description 6
Lecture 29 - Response-based Description 7

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Lecture 30	- Response-based Description	8
Lecture 31	- Response-based Description	9
Lecture 32	- Response-based Description	10
Lecture 33	- Response-based Description	11
Lecture 34	- Response-based Description	12
Lecture 35	- Response-based Description	13
Lecture 36	- Discrete time LTI system	1
Lecture 37	- Discrete time LTI system	2
Lecture 38	- z-Domain Descriptions	1
Lecture 39	- z-Domain Descriptions	2
Lecture 40	- z-Domain Descriptions	3
Lecture 41	- z-Domain Descriptions	4
Lecture 42	- z-Domain Descriptions	5
Lecture 43	- z-Domain Descriptions	6
Lecture 44	- State Space Representation	1
Lecture 45	- State Space Representation	2
Lecture 46	- State Space Representation	3
Lecture 47	- State Space Representation	4
Lecture 48	- Sampled - Data Systems	1
Lecture 49	- Sampled - Data Systems	2
Lecture 50	- Sampled - Data Systems	3
Lecture 51	- Sampled - Data Systems	4
Lecture 52	- Sampled - Data Systems	5
Lecture 53	- Sampled - Data Systems	6
Lecture 54	- Sampled - Data Systems	7
Lecture 55	- Sampled - Data Systems	8
Lecture 56	- Probability_Random variables and moments	- Review 1
Lecture 57	- Probability_Random variables and moments	- Review 2
Lecture 58	- Probability_Random variables and moments	- Review 3
Lecture 59	- Probability_Random variables and moments	- Review 4
Lecture 60	- Probability_Random variables and moments	- Review 5
Lecture 61	- Probability_Random variables and moments	- Review 6
Lecture 62	- Random Processes	- Review 1
Lecture 63	- Random Processes	- Review 2
Lecture 64	- Random Processes	- Review 3
Lecture 65	- Random Processes	- Review 4
Lecture 66	- Random Processes	- Review 5
Lecture 67	- Random Processes	- Review 6 (MATLAB)
Lecture 68	- Random Processes	- Review 7

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- Lecture 69 - Random Processes - Review 8
- Lecture 70 - Spectral Representation 1
- Lecture 71 - Spectral Representation 2
- Lecture 72 - Spectral Representation 3
- Lecture 73 - Models for Identification 1
- Lecture 74 - Models for Identification 2
- Lecture 75 - Models for Identification 3
- Lecture 76 - Models for Identification 4
- Lecture 77 - One step and multi-step ahead prediction 1
- Lecture 78 - One step and multi-step ahead prediction 2
- Lecture 79 - One step and multi-step ahead prediction 3
- Lecture 80 - One step and multi-step ahead prediction 4
- Lecture 81 - One step and multi-step ahead prediction 5
- Lecture 82 - Introduction to estimation theory 1
- Lecture 83 - Introduction to estimation theory 2
- Lecture 84 - Fisher's information and properties of estimators 1
- Lecture 85 - Fisher's information and properties of estimators 2
- Lecture 86 - Fisher's information and properties of estimators 3
- Lecture 87 - Fisher's information and properties of estimators 4
- Lecture 88 - Fisher's information and properties of estimators 5
- Lecture 89 - Fisher's information and properties of estimators 6
- Lecture 90 - Fisher's information and properties of estimators 7
- Lecture 91 - Fisher's information and properties of estimators 8
- Lecture 92 - Fisher's information and properties of estimators 9
- Lecture 93 - Fisher's information and properties of estimators 10
- Lecture 94 - Fisher's information and properties of estimators 11
- Lecture 95 - Fisher's information and properties of estimators 12
- Lecture 96 - Fisher's information and properties of estimators 13
- Lecture 97 - Fisher's information and properties of estimators 14
- Lecture 98 - Fisher's information and properties of estimators 15
- Lecture 99 - Estimation of non-parametric model 1
- Lecture 100 - Estimation of non-parametric model 2
- Lecture 101 - Estimation of non-parametric model 3
- Lecture 102 - Estimation of non-parametric model 4
- Lecture 103 - Estimation of non-parametric model 5
- Lecture 104 - Estimation of non-parametric model 3
- Lecture 105 - Estimation of non-parametric model 4
- Lecture 106 - Estimation of non-parametric model 5
- Lecture 107 - Estimation of parametric model 1

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- Lecture 108 - Estimation of parametric model 2
- Lecture 109 - Estimation of parametric model 3
- Lecture 110 - Estimation of parametric model 4
- Lecture 111 - State-Space/Subspace identification 1
- Lecture 112 - State-Space/Subspace identification 2
- Lecture 113 - State-Space/Subspace identification 3
- Lecture 114 - State-Space/Subspace identification 4
- Lecture 115 - State-Space/Subspace identification 5
- Lecture 116 - State-Space/Subspace identification 6
- Lecture 117 - State-Space/Subspace identification 7
- Lecture 118 - State-Space/Subspace identification 8
- Lecture 119 - Input for Identification
- Lecture 120 - Input for Identification
- Lecture 121 - Input for Identification

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

NPTEL Video Course - Chemical Engineering - Chemical Technology - I

Subject Co-ordinator - Dr. I.D. Mall

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction to Chemical process Industries

Lecture 2 - Raw material for Organic Chemical Industries

Lecture 3 - Unit processes and unit operations in organic chemical Industries

Lecture 4 - Coal and coal as chemicals feed stock

Lecture 5 - Coal carbonization and Coke oven plant

Lecture 6 - Gasification of Coal, Petrocoke and Biomass

Lecture 7 - Introduction to Pulp and paper Industry, Raw material for paper industry and Technological developments

Lecture 8 - Pulping and Bleaching

Lecture 9 - Recovery of Chemicals

Lecture 10 - Stock preparation and paper making

Lecture 11 - Introduction to Soap and detergent, Soap making and Recovery of Glycerine

Lecture 12 - Synthetic detergent and Linear alkyl benzene

Lecture 13 - Sugar and Fermentation industry

Lecture 14 - Ethanol as Biofuel and Chemical feed stock

Lecture 15 - Introduction

Lecture 16 - Evaluation of Crude oil, Petroleum Products and Petrochemicals

Lecture 17 - Crude oil Distillation

Lecture 18 - Thermal Cracking

Lecture 19 - Catalytic cracking

Lecture 20 - Catalytic reforming

Lecture 21 - Alkylation, Isomerisation and Polymerisation

Lecture 22 - Desulphurisation Processes and Recovery of Sulphur

Lecture 23 - Profile of petrochemical Industry and its structure

Lecture 24 - Naphtha and gas cracking for production of olefins

Lecture 25 - Recovery of chemicals from FCC and steam cracking

Lecture 26 - Synthesis gas and its derivatives

Lecture 27 - Ethylene derivatives

Lecture 28 - Propylene, Propylene oxide and Isopropanol

Lecture 29 - Aromatics Production

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

- Lecture 30 - Aromatics product profile, Ethyl benzene & Styrene, Cumene and phenol, Bisphenol, Aniline
- Lecture 31 - Introduction to polymer, Elastomer and Synthetic Fibre, Polymerisation
- Lecture 32 - Polymers
- Lecture 33 - Polyvinylchloride, polycarbonate, thermoset resin
- Lecture 34 - Elastomers
- Lecture 35 - Polyamides or Nylons(PA)
- Lecture 36 - DMT and Terephthalic Acid, Polyester, PET resin, PTB resin
- Lecture 37 - Acrylic Fibre, Modified Acrylic Fibre, Acrylonitrile, Acrolein, Propylene Fibre, Polyurethane
- Lecture 38 - Viscose Rayon and Acetate rayon
- Lecture 39 - Pesticide
- Lecture 40 - Dye and Intermediates

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

NPTEL Video Course - Chemical Engineering - Process Integration

Subject Co-ordinator - Dr. B. Mohanty

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Process integration, methods and area of application

Lecture 2 - Fundamental concepts related to heat integration - Part 1

Lecture 3 - Fundamental concepts related to heat integration - Part 2

Lecture 4 - Data extraction

Lecture 5 - Hot composite curves

Lecture 6 - Cold composite curves

Lecture 7 - Hot and cold composite curves and the pinch

Lecture 8 - Threshold problems

Lecture 9 - Energy targeting procedure

Lecture 10 - Problem Table Algorithm - Part 1

Lecture 11 - Grand composite curve

Lecture 12 - Problem Table Algorithm - Part 2

Lecture 13 - Number of units target

Lecture 14 - Shell targeting - Part 1

Lecture 15 - Area targeting - Part 1

Lecture 16 - Area targeting - Part 2

Lecture 17 - Coast targeting - Part 1

Lecture 18 - Coast targeting - Part 2

Lecture 19 - Supertargeting- optimization of $\hat{I} \ t \ min$

Lecture 20 - Global & stream specific $\hat{I} \ t \ min$ and its relevance

Lecture 21 - Topology Trap

Lecture 22 - Rules for Pinch Design Method (PDM) - Part 1

Lecture 23 - Rules for Pinch Design Method (PDM) - Part 2

Lecture 24 - Application of PDM for MER Hen Synthesis

Lecture 25 - Design for threshold problems

Lecture 26 - Design for single pinch problems

Lecture 27 - Design for multi pinch problems

Lecture 28 - HEN optimization

Lecture 29 - Remaining problem analysis

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

- Lecture 30 - Driving Force Plot
- Lecture 31 - Low Temperature process Design - Part 1
- Lecture 32 - Low Temperature process Design - Part 2
- Lecture 33 - Integration of Gas turbine with process - Part 1
- Lecture 34 - Integration of Gas turbine with process - Part 2
- Lecture 35 - Placement and Integration of Distillation Column
- Lecture 36 - Heat Integration of evaporators
- Lecture 37 - Integration of heat pump
- Lecture 38 - Placement of Heat Engine, Heat pump and Reactors
- Lecture 39 - Integration of Furnace
- Lecture 40 - Problem solving using HINT Software - Part 1
- Lecture 41 - Problem solving using HINT Software - Part 2
- Lecture 42 - Problem solving using HINT Software - Part 3
- Lecture 43 - Problem solving using HINT Software - Part 4

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

NPTEL Video Course - Chemical Engineering - Mechanical Operations

Subject Co-ordinator - Prof. Shabina Khanam

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction
- Lecture 2 - Characterization of a single particle - 1
- Lecture 3 - Characterization of a single particle - 2
- Lecture 4 - Characterization of collection of particles - 1
- Lecture 5 - Characterization of collection of particles - 2
- Lecture 6 - Fine grain size distribution
- Lecture 7 - Effectiveness of screen - 1
- Lecture 8 - Effectiveness of screen - 2
- Lecture 9 - Industrial screening equipment
- Lecture 10 - Size reduction
- Lecture 11 - Laws of comminution
- Lecture 12 - Examples of Laws of comminution - 1
- Lecture 13 - Examples of Laws of comminution - 2
- Lecture 14 - Size reduction equipment - 1
- Lecture 15 - Size reduction equipment - 2
- Lecture 16 - Particle dynamics - 1
- Lecture 17 - Particle dynamics - 2
- Lecture 18 - Particle dynamics-Examples
- Lecture 19 - Classification and Jigging - 1
- Lecture 20 - Classification and Jigging - 2

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

NPTEL Video Course - Chemical Engineering - NOC:Waste to Energy Conversion

Subject Co-ordinator - Prof. P. Mondal

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction - 1
- Lecture 2 - Introduction - 2
- Lecture 3 - Characterization of wastes - 1
- Lecture 4 - Characterization of wastes - 2
- Lecture 5 - Characterization of wastes - 3
- Lecture 6 - Tutorial on Characterization of wastes
- Lecture 7 - Energy production from wastes through incineration - 1
- Lecture 8 - Energy production from wastes through incineration - 2
- Lecture 9 - Tutorial on incineration
- Lecture 10 - Energy production from wastes through gasification - 1
- Lecture 11 - Energy production from wastes through gasification - 2
- Lecture 12 - Syngas utilization - 1
- Lecture 13 - Syngas utilization - 2
- Lecture 14 - Energy production from wastes through pyrolysis - 1
- Lecture 15 - Energy production from wastes through pyrolysis - 2
- Lecture 16 - Tutorial on gasification
- Lecture 17 - Tutorial on Pyrolysis
- Lecture 18 - Densification of solids - 1
- Lecture 19 - Densification of solids - 2
- Lecture 20 - Efficiency improvement of power plant - 1
- Lecture 21 - Efficiency improvement of power plant - 2
- Lecture 22 - Energy production from waste plastics - 1
- Lecture 23 - Energy production from waste plastics - 2
- Lecture 24 - Gas clean up - 1
- Lecture 25 - Gas clean up - 2
- Lecture 26 - Energy production from organic wastes through anaerobic digestion - 1
- Lecture 27 - Energy production from organic wastes through anaerobic digestion - 2
- Lecture 28 - Design of anaerobic digester
- Lecture 29 - Introduction to Microbial fuel cells

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- Lecture 30 - Energy production from organic wastes through fermentation - 1
- Lecture 31 - Energy production from organic wastes through fermentation - 2
- Lecture 32 - Tutorial on anaerobic digestion
- Lecture 33 - Tutorial on fermentation
- Lecture 34 - Energy production from wastes through transesterification - 1
- Lecture 35 - Energy production from wastes through transesterification - 2
- Lecture 36 - Tutorial on transesterification
- Lecture 37 - Cultivation of algal biomass and treatment of waste water - 1
- Lecture 38 - Cultivation of algal biomass and treatment of waste water - 2
- Lecture 39 - Energy production form algal biomass - 1
- Lecture 40 - Energy production form algal biomass - 2

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

NPTEL Video Course - Chemical Engineering - NOC:Unit Operations of Particulate Matter

Subject Co-ordinator - Prof. Shabina Khanam

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction
Lecture 2 - Sedimentation and Batch Sedimentation Test - 1
Lecture 3 - Sedimentation and Batch Sedimentation Test - 2
Lecture 4 - Centrifugal Sedimentation and Equipment - 1
Lecture 5 - Centrifugal Sedimentation and Equipment - 2
Lecture 6 - Filtration - 1
Lecture 7 - Filtration - 2
Lecture 8 - Filtration - 3
Lecture 9 - Continuous Filtration - 1
Lecture 10 - Continuous Filtration - 2
Lecture 11 - Fluidisation - 1
Lecture 12 - Fluidisation - 2
Lecture 13 - Liquid Fluidisation
Lecture 14 - Gas Fluidisation - 1
Lecture 15 - Gas Fluidisation - 2
Lecture 16 - Flotation - 1
Lecture 17 - Flotation - 2
Lecture 18 - Transportaion of solids - 1
Lecture 19 - Transportaion of solids - 2
Lecture 20 - Transportaion of solids - 3

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NPTEL Video Course - Chemical Engineering - NOC:Introduction to Polymer Physics (IIT-R)

Subject Co-ordinator - Prof. Prateek Kumar Jha

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction to the course, Macromolecules and Life, Molecular flexibility
- Lecture 2 - Classification of polymers, Types of polymerization, Average molecular weights and polydispersity
- Lecture 3 - Motivation to study polymer physics
- Lecture 4 - Random Walk Models of Single Chain I
- Lecture 5 - Random Walk Models of Single Chain II
- Lecture 6 - Random Walk Models of Single Chain III
- Lecture 7 - Models of semiflexible chains (Kratky Porod Model) - Part I
- Lecture 8 - Models of semiflexible chains (Kratky Porod Model) - Part II
- Lecture 9 - Probability density of an ideal chain - Part I
- Lecture 10 - Probability density of an ideal chain - Part II
- Lecture 11 - Entropic Elasticity, Bead-Spring Model, Simulations of random walk models
- Lecture 12 - Derivation of Diffusion equation, Einstein notation
- Lecture 13 - Definition of Radius of gyration
- Lecture 14 - Radius of gyration for an ideal chain, concept of ideality
- Lecture 15 - Nonbonded interactions, hydrophobic and hydrophilic behaviour
- Lecture 16 - Definition of excluded volume; good, bad, and theta solvent
- Lecture 17 - Virial expansion, Flory theory for good solvent
- Lecture 18 - Flory theory for bad solvent, self-similarity and fractal nature of polymers
- Lecture 19 - Derivation of fractal dimension, concentration regimes and overlap concentration
- Lecture 20 - Size, shape, and structure. Gyration tensor and measures of asphericity.
- Lecture 21 - Order-disorder transition
- Lecture 22 - Scattering experiments, Pair correlation function
- Lecture 23 - Structure of polymer chain, Introduction to Monte Carlo simulations of polymer chains
- Lecture 24 - Monte Carlo algorithm
- Lecture 25 - Practical aspects of Monte Carlo simulation
- Lecture 26 - Molecular Dynamics Simulations, Review of Thermodynamics
- Lecture 27 - Solution Thermodynamics - I
- Lecture 28 - Solution Thermodynamics - II
- Lecture 29 - Solution Thermodynamics - III

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- Lecture 30 - Solution Thermodynamics - IV
- Lecture 31 - Phase separation regime, Introduction to lattice model of solutions
- Lecture 32 - Lattice Model of Solutions - I
- Lecture 33 - Lattice Model of Solutions - II
- Lecture 34 - Phase behaviour of liquid solutions
- Lecture 35 - Lattice models of polymeric systems
- Lecture 36 - Brownian motion - I
- Lecture 37 - Brownian motion - II
- Lecture 38 - Brownian motion - III
- Lecture 39 - Brownian motion - IV
- Lecture 40 - Brownian motion - V
- Lecture 41 - Rouse Model - I
- Lecture 42 - Rouse Model - II
- Lecture 43 - Rouse Model - III
- Lecture 44 - Rouse Model - IV
- Lecture 45 - Problems in Rouse Model, Hydrodynamic Interactions
- Lecture 46 - Zimm Model - I
- Lecture 47 - Zimm Model - II
- Lecture 48 - Continuum Mechanics - I
- Lecture 49 - Continuum Mechanics - II
- Lecture 50 - Kuhn's Theory of Rubber Elasticity
- Lecture 51 - Elasticity of polymer network
- Lecture 52 - Microscopic definition of stress tensor - I
- Lecture 53 - Microscopic definition of stress tensor - II, Dumbbell model, introduction to Rouse model
- Lecture 54 - Models for entangled polymeric systems - I
- Lecture 55 - Models for entangled polymeric systems - II
- Lecture 56 - Rheology of complex fluids
- Lecture 57 - Rheometers and rheological tests - I
- Lecture 58 - Rheometers and rheological tests - II
- Lecture 59 - Maxwell model - I
- Lecture 60 - Maxwell model - II, Closing notes

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NPTEL Video Course - Chemical Engineering - NOC:Equipment Design: Mechanical Aspects

Subject Co-ordinator - Prof. Shabina Khanam

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction
Lecture 2 - Stress and Strain Relationship - 1
Lecture 3 - Stress and Strain Relationship - 2
Lecture 4 - Terminologies
Lecture 5 - Design of shell
Lecture 6 - Design of heads - 1
Lecture 7 - Design of heads - 2
Lecture 8 - Design of heads - 3
Lecture 9 - Compensation for Opening - 1
Lecture 10 - Compensation for Opening - 2
Lecture 11 - L D ratio
Lecture 12 - Design of Flanges - 1.1
Lecture 13 - Design of Flanges - 1.2
Lecture 14 - Design of Flanges - 2.1
Lecture 15 - Design of Flanges - 2.2
Lecture 16 - Design of support - 1
Lecture 17 - Design of support - 2
Lecture 18 - Vessel under external pressure - 1
Lecture 19 - Vessel under external pressure - 2
Lecture 20 - Vessel under very high pressure

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

NPTEL Video Course - Chemical Engineering - Chemical Reaction Engineering

Subject Co-ordinator - Prof. Jayant M Modak

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction & Overview
- Lecture 2 - Basic concepts
- Lecture 3 - Thermodynamics of Chemical Reactions - Part I
- Lecture 4 - Thermodynamics of Chemical Reactions - Part II
- Lecture 5 - Chemical Reaction Kinetics - Overview
- Lecture 6 - Chemical Reaction Kinetics & Reactor Design
- Lecture 7 - Chemical Reactor Design
- Lecture 8 - Problem Solving
- Lecture 9 - Complex Reactions - Introduction
- Lecture 10 - Complex Reactions - Yield & Selectivity
- Lecture 11 - Complex Reactions - Quasi Steady State and Quasi Equilibrium Approximations
- Lecture 12 - Complex Reactions - Kinetics of Chain Reactions & polymerization
- Lecture 13 - Catalytic reactions - Introduction
- Lecture 14 - Catalytic reactions - Adsorption & Desorption
- Lecture 15 - Catalytic reactions - Kinetics
- Lecture 16 - Monomolecular Reaction Network & Lumping Analysis
- Lecture 17 - Problem solving
- Lecture 18 - Gas-solid Catalytic Reactions - External diffusion
- Lecture 19 - Gas-solid Catalytic Reactions - Transport in Catalyst Pellet
- Lecture 20 - Gas-solid Catalytic Reactions - Diffusion & Reaction - I
- Lecture 21 - Gas-solid Catalytic Reactions - Diffusion & Reaction - II
- Lecture 22 - Gas-solid Catalytic Reactions - Diffusion & Reaction - III
- Lecture 23 - Gas-solid Catalytic Reactions - Nonisothermal effects
- Lecture 24 - Gas-solid Noncatalytic Reactions
- Lecture 25 - Gas-Liquid Reactions
- Lecture 26 - Problem solving
- Lecture 27 - Chemical Reactor Design
- Lecture 28 - Chemical Reactor Design
- Lecture 29 - Nonisothermal Reactor Operation

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

- Lecture 30 - Case Study - Ethane dehydrogenation
- Lecture 31 - Case Study - Hydrogenation of Oil
- Lecture 32 - Case Study - Ammonia Synthesis
- Lecture 33 - Autothermal reactors
- Lecture 34 - Parametric Sensitivity
- Lecture 35 - CSTR - multiple steady states
- Lecture 36 - Stability Analysis - Basics
- Lecture 37 - Stability Analysis - Examples
- Lecture 38 - Nonideal flow and reactor performance - I
- Lecture 39 - Nonideal flow and reactor performance - II
- Lecture 40 - Problem solving

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

NPTEL Video Course - Chemical Engineering - Fundamentals of Transport Processes

Subject Co-ordinator - Prof. V. Kumaran

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction
- Lecture 2 - Dimensional Analysis
- Lecture 3 - Dimensional Analysis (Continued...)
- Lecture 4 - Dimensionless Groups
- Lecture 5 - Continuum description
- Lecture 6 - Mechanisms of diffusion - I
- Lecture 7 - Mechanisms of diffusion - II
- Lecture 8 - Unidirectional Transport Cartesian Coordinates - I
- Lecture 9 - Unidirectional Transport Cartesian Coordinates - II Similarity Solutions
- Lecture 10 - Unidirectional Transport Cartesian Coordinates - III Similarity Solutions
- Lecture 11 - Unidirectional Transport Cartesian Coordinates - IV Separation of Variables
- Lecture 12 - Unidirectional Transport Cartesian Coordinates - V Separation of Variables
- Lecture 13 - Unidirectional Transport Cartesian Coordinates - VI Oscillatory Flows
- Lecture 14 - Unidirectional Transport Cartesian Coordinates - VII Momentum Source in the Flow
- Lecture 15 - Unidirectional Transport Cartesian Coordinates - VIII Heat & Mass Sources
- Lecture 16 - Unidirectional Transport Cylindrical Coordinates - I Conservation Equations
- Lecture 17 - Unidirectional Transport Cylindrical Coordinates - II Similarity Solutions
- Lecture 18 - Unidirectional Transport Cylindrical Coordinates - III Separation of Variables
- Lecture 19 - Unidirectional Transport Cylindrical Coordinates - IV Steady flow in a pipe
- Lecture 20 - Unidirectional Transport Cylindrical Coordinates - V Oscillatory flow in a pipe
- Lecture 21 - Unidirectional Transport Cylindrical Coordinates - VI Oscillatory flow in a pipe Regular Perturbation
- Lecture 22 - Unidirectional Transport Cylindrical Coordinates - VII Oscillatory flow in a pipe Singular Perturbation
- Lecture 23 - Unidirectional Transport Spherical Coordinates - I Balance Equation
- Lecture 24 - Unidirectional Transport Spherical Coordinates - II Separation of Variables
- Lecture 25 - Mass & Energy Conservation Cartesian Coordinates
- Lecture 26 - Mass & Energy Conservation Cartesian Coordinates Heat Conduction in a Cube
- Lecture 27 - Mass & Energy Conservation Spherical Coordinates Balance Laws
- Lecture 28 - Mass & Energy Conservation Cylindrical Coordinates
- Lecture 29 - Diffusion Equation Spherical Co-ordinates Separation of Variables

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

- Lecture 30 - Diffusion Equation Spherical Co-ordinates Separation of Variables (Continued...)
- Lecture 31 - Diffusion Equation Spherical Co-ordinates Effective Conductivity of a Composite
- Lecture 32 - Diffusion Equation Spherical Harmonics
- Lecture 33 - Diffusion Equation Delta Functions
- Lecture 34 - Diffusion Equation Multipole Expansions
- Lecture 35 - Diffusion Equation Greens Function Formulations
- Lecture 36 - High Peclet Number Transport Flow Past a Flat Plate
- Lecture 37 - High Peclet Number Transport Heat Transfer from a Spherical Particle - I
- Lecture 38 - High Peclet Number Transport Heat Transfer from a Spherical Particle - II
- Lecture 39 - High Peclet Number Transport Heat Transfer from a Gas Bubble
- Lecture 40 - Summary

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

NPTEL Video Course - Chemical Engineering - Fundamentals of Transport Processes - II

Subject Co-ordinator - Prof. V. Kumaran

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Review of Fundamentals of Transport Processes I

Lecture 2 - Introduction

Lecture 3 - Vectors and Tensors

Lecture 4 - Vector calculus

Lecture 5 - Vector calculus

Lecture 6 - Curvilinear co-ordinates

Lecture 7 - Kinematics

Lecture 8 - Rate of deformation tensor

Lecture 9 - Mass conservation equation

Lecture 10 - Momentum conservation equation

Lecture 11 - Angular momentum conservation equation

Lecture 12 - Boundary conditions

Lecture 13 - Mechanical energy conservation

Lecture 14 - Unidirectional flow

Lecture 15 - Viscous flows

Lecture 16 - Viscous flows

Lecture 17 - Flow around a sphere

Lecture 18 - Force on moving sphere

Lecture 19 - Torque on rotating sphere

Lecture 20 - Effective viscosity of a suspension

Lecture 21 - Flow in a corner

Lecture 22 - Lubrication flow

Lecture 23 - Lubrication flow

Lecture 24 - Inertia of a low Reynolds number

Lecture 25 - Potential flow

Lecture 26 - Potential flow around a sphere

Lecture 27 - Two-dimensional potential flow

Lecture 28 - Two-dimensional potential flow

Lecture 29 - Flow around a cylinder

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

- Lecture 30 - Conformal transforms in potential flow
- Lecture 31 - Boundary layer theory
- Lecture 32 - Boundary layer past a flat plate
- Lecture 33 - Stagnation point flow
- Lecture 34 - Falkner-Skan Boundary Layer Solutions
- Lecture 35 - Falkner-Skan Boundary Layer Solutions
- Lecture 36 - Vorticity Dynamics
- Lecture 37 - Vorticity Dynamics
- Lecture 38 - Turbulence
- Lecture 39 - Turbulence
- Lecture 40 - Turbulent flow in a channel

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

NPTEL Video Course - Chemical Engineering - Modern Instrumental Methods of Analysis

Subject Co-ordinator - Dr. J.R. Mudakavi

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to the Modern Instrumental Methods of Analysis
- Lecture 2 - Atomic Structure
- Lecture 3 - Physical Properties of Electromagnetic Radiation
- Lecture 4 - Interaction of Matter with Radiation
- Lecture 5 - Ultraviolet and Visible Spectrophotometry-1 (i. Theoretical Aspects)
- Lecture 6 - Ultraviolet and Visible Spectrophotometry-2 (ii. Theoretical Aspects)
- Lecture 7 - Ultraviolet and Visible Spectrophotometry-3 (iii. Theoretical Aspects)
- Lecture 8 - Ultraviolet and Visible Spectrophotometry-4 (iv. Instrumentation)
- Lecture 9 - Ultraviolet and Visible Spectrophotometry-5 (v. Instrumentation)
- Lecture 10 - Ultraviolet and Visible Spectrophotometry-6 (vi. Applications)
- Lecture 11 - Fluorescence and Phosphorescence Spectrophotometry-1 (i. Theoretical Aspects)
- Lecture 12 - Fluorescence and Phosphorescence Spectrophotometry-2 (ii. Instrumentation)
- Lecture 13 - Fluorescence and Phosphorescence Spectrophotometry-3 (iii. Application)
- Lecture 14 - Atomic Fluorescence (i. Theoretical aspects)
- Lecture 15 - X- Ray Analytical Techniques-1 (ii. Instrumentation)
- Lecture 16 - X- Ray Analytical Techniques-2 (iii. Applications)
- Lecture 17 - Atomic Absorption Spectrometry-1 (i. Theoretical Aspects)
- Lecture 18 - Atomic Absorption Spectrometry-2 (ii. Theoretical Aspects)
- Lecture 19 - Atomic Absorption Spectrometry-3 (iii. Instrumentation)
- Lecture 20 - Atomic Absorption Spectrometry-4 (iv. Instrumentation)
- Lecture 21 - Atomic Absorption Spectrometry-5 (v. Instrumentation)
- Lecture 22 - Atomic Absorption Spectrometry-6 (vi. Signal handling)
- Lecture 23 - Atomic Absorption Spectrometry-7 (vii. Interferences)
- Lecture 24 - Atomic Absorption Spectrometry-8 (viii. Hydride Generation AAS)
- Lecture 25 - Atomic Absorption Spectrometry-9 (ix. Cold Vapour Mercury AAS)
- Lecture 26 - Electrothermal Atomic Absorption Spectrometry-10 (x. Electrothermal Aspects)
- Lecture 27 - Electrothermal Atomic Absorption Spectrometry-11 (xi. Practical Aspects)
- Lecture 28 - Inductively Coupled Plasma Atomic Emission Spectrometry-1 (i. Theoretical Aspects)
- Lecture 29 - Inductively Coupled Plasma Atomic Emission Spectrometry-2 (ii. Instrumentation)

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

- Lecture 30 - Inductively Coupled Plasma Atomic Emission Spectrometry-3 (iii. Comparison of ICP & AAS)
- Lecture 31 - Infrared Spectroscopy-1 (i. Theoretical Aspects)
- Lecture 32 - Infrared Spectroscopy-2 (ii. Practical Aspects)
- Lecture 33 - Infrared Spectroscopy-3 (iii. Nondispersive IR, Mass spectrometer)
- Lecture 34 - Introduction to Mass Spectrometry
- Lecture 35 - Introduction to Nuclear Magnetic Resonance Spectroscopy
- Lecture 36 - Fundamentals of Electrochemical Techniques-1 (i. Introduction)
- Lecture 37 - Fundamentals of Electrochemical Techniques-2 (ii. Introduction) (Continued...)
- Lecture 38 - Polarography-1 (i. Introduction)
- Lecture 39 - Polarography-2 (ii. Applications)
- Lecture 40 - Chromatography-1 (i. Introduction)
- Lecture 41 - Gas chromatography-1 (i. Instrumentation)
- Lecture 42 - Gas chromatography-2 (ii. Applications)
- Lecture 43 - Gas chromatography-3 (iii. Applications)

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

NPTEL Video Course - Chemical Engineering - NOC:Transport Processes I: Heat and Mass Transfer

Subject Co-ordinator - Prof. V. Kumaran

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Why do we study transport processes?

Lecture 2 - Transport by convection and diffusion

Lecture 3 - Non-dimensional analysis of beams

Lecture 4 - Dimensional analysis: Force on a particle settling in a fluid

Lecture 5 - Dimensional analysis: Heat transfer in a heat exchanger

Lecture 6 - Dimensional analysis: Mass transfer from a particle suspended in a fluid

Lecture 7 - Dimensional analysis: Power of an impeller

Lecture 8 - Dimensional analysis: Scaling up of an impeller

Lecture 9 - Dimensional analysis: Convection and diffusion

Lecture 10 - Dimensional analysis: Physical interpretation of dimensionless groups

Lecture 11 - Dimensional analysis: Correlations for dimensionless groups

Lecture 12 - Dimensional analysis: Natural and forced convection

Lecture 13 - Continuum description of fluids

Lecture 14 - Conservation equations and constitutive relations

Lecture 15 - Diffusion: Mechanism of mass diffusion in gases

Lecture 16 - Diffusion: Estimation of mass diffusion coefficient

Lecture 17 - Diffusion: Momentum diffusion coefficient

Lecture 18 - Diffusion: Thermal diffusion coefficient

Lecture 19 - Unidirectional transport: Conservation equation for heat and mass transfer

Lecture 20 - Unidirectional transport: Conservation equation for momentum transfer

Lecture 21 - Unidirectional transport: Similarity solution for infinite domain

Lecture 22 - Unidirectional transport: Similarity solution for infinite domain continued

Lecture 23 - Unidirectional transport: Similarity solution for mass transfer into a falling film

Lecture 24 - Unidirectional transport: Similarity solution for decay of a pulse

Lecture 25 - Unidirectional transport: Similarity solution for decay of a pulse continued

Lecture 26 - Unidirectional transport: Separation of variables for transport in a finite domain

Lecture 27 - Unidirectional transport: Separation of variables for transport in a finite domain (Continued...)

Lecture 28 - Unidirectional transport: Separation of variables for transport in a finite domain (Continued...)

Lecture 29 - Unidirectional transport: Separation of variables for transport in a finite domain (Continued...)

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- Lecture 30 - Unidirectional transport: Balance laws in cylindrical co-ordinates. Heat transfer across the wall
- Lecture 31 - Unidirectional transport: Balance laws in cylindrical co-ordinates. Unsteady heat conduction from a wall
- Lecture 32 - Unidirectional transport: Balance laws in cylindrical co-ordinates. Unsteady heat conduction from a wall
- Lecture 33 - Unidirectional transport: Balance laws in cylindrical co-ordinates. Unsteady heat conduction from a wall
- Lecture 34 - Unidirectional transport: Balance laws in cylindrical co-ordinates. Similarity solution for heat transfer
- Lecture 35 - Unidirectional transport: Effect of body force in momentum transfer. Falling film
- Lecture 36 - Unidirectional transport: Effect of pressure in momentum transfer. Flow in a pipe.
- Lecture 37 - Unidirectional transport: Friction factor for flow in a pipe
- Lecture 38 - Unidirectional transport: Laminar and turbulent flow in a pipe
- Lecture 39 - Unidirectional transport: Laminar and turbulent flow in a pipe
- Lecture 40 - Unidirectional transport: Oscillatory flow in a pipe. Solution using complex variables
- Lecture 41 - Unidirectional transport: Oscillatory flow in a pipe. Solution using complex variables
- Lecture 42 - Unidirectional transport: Oscillatory flow in a pipe. Solution using complex variables (Continued)
- Lecture 43 - Unidirectional transport: Oscillatory flow in a pipe. Low and high Reynolds number solutions
- Lecture 44 - Unidirectional transport: Spherical co-ordinates. Heat conduction from a sphere
- Lecture 45 - Mass and energy balance equations in Cartesian co-ordinates
- Lecture 46 - Mass and energy balance equations in Cartesian co-ordinates Vector notation
- Lecture 47 - Mass and energy balance equations in spherical co-ordinates
- Lecture 48 - Mass and energy balance equations in spherical co-ordinates
- Lecture 49 - Momentum balance: Incompressible Navier-Stokes equations
- Lecture 50 - Balance equation: Convection and diffusion dominated regimes
- Lecture 51 - Diffusion equation: Heat conduction in a rectangular solid
- Lecture 52 - Diffusion equation: Heat conduction in a rectangular solid (Continued...)
- Lecture 53 - Diffusion equation: Heat conduction around a spherical inclusion
- Lecture 54 - Diffusion equation: Heat conduction around a spherical inclusion
- Lecture 55 - Diffusion equation: Effective conductivity of a composite
- Lecture 56 - Diffusion equation: Spherical harmonic solutions
- Lecture 57 - Diffusion equation: Conduction from a point source
- Lecture 58 - Diffusion equation: Method of Greens functions
- Lecture 59 - Diffusion equation: Method of images
- Lecture 60 - Diffusion equation: Equivalence of spherical harmonics and multipole expansion

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

NPTEL Video Course - Chemical Engineering - NOC:Atomic and Molecular Absorption Spectrometry for Pollution Mo

Subject Co-ordinator - Dr. J.R. Mudakavi

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Course Introduction

Lecture 2 - Atomic structure

Lecture 3 - Interaction of EM radiation with matter

Lecture 4 - Atomic and molecular orbitals

Lecture 5 - Interaction of EM radiation with matter - I

Lecture 6 - Interaction of EM radiation with matter - II

Lecture 7 - Interaction of interaction of EM radiation with matter - III

Lecture 8 - Emission and absorption spectra

Lecture 9 - MO theory

Lecture 10 - Structure \hat{A} property relationship of organic compounds

Lecture 11 - Woodward Fieser rules, structure \hat{A} property relationship

Lecture 12 - Beer-Lamberts law

Lecture 13 - Deviations from Beer-Lamberts law, relative concentration error, instrumentation - I

Lecture 14 - UV-Visible spectrophotometry, instrumentation - II

Lecture 15 - UV-Visible spectrophotometry, instrumentation - III

Lecture 16 - UV-Visible spectrophotometry, instrumentation - IV

Lecture 17 - Quantitative analysis \hat{A} I

Lecture 18 - Quantitative analysis \hat{A} II

Lecture 19 - Quantitative analysis \hat{A} III

Lecture 20 - Quantitative analysis \hat{A} IV

Lecture 21 - Fluorescence spectrophotometry \hat{A} I

Lecture 22 - Fluorescence spectrophotometry - II

Lecture 23 - Fluorescence spectrophotometry - III

Lecture 24 - Instrumentation

Lecture 25 - Chemical analysis, applications

Lecture 26 - Chemiluminescence, principles

Lecture 27 - Status of spectrophotometry vis a vis environment

Lecture 28 - Separations methods

Lecture 29 - Method development

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- Lecture 30 - Boron, chloride
- Lecture 31 - Fluoride
- Lecture 32 - Phenols
- Lecture 33 - Arsenic, Free chlorine
- Lecture 34 - Magnesium
- Lecture 35 - Nonionic surfactants, iron, phosphate
- Lecture 36 - Nitrite , manganese
- Lecture 37 - Cadmium, copper, lead
- Lecture 38 - Total hardness, zinc
- Lecture 39 - Nitrate, chromium
- Lecture 40 - Determination of aluminum, cyanide, sulphate
- Lecture 41 - Sulphate, ammonia, Conclusions

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

NPTEL Video Course - Chemical Engineering - NOC:Trace and Ultra-trace Analysis of Metals using Atomic Absorption Spectrometry

Subject Co-ordinator - Dr. J.R. Mudakavi

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Course Introduction
- Lecture 2 - Atomic structure - I
- Lecture 3 - Atomic structure - II
- Lecture 4 - Electronic arrangement in the Elements - I
- Lecture 5 - Electronic arrangement in the Elements - II
- Lecture 6 - Interaction of EM radiation with matter - I
- Lecture 7 - Interaction of EM radiation with matter - II
- Lecture 8 - Interaction of EM radiation with matter - III
- Lecture 9 - Interaction of EM radiation with matter - IV
- Lecture 10 - Theoretical basis of AAS - I
- Lecture 11 - Theoretical basis of AAS - II
- Lecture 12 - Theoretical basis of AAS - III
- Lecture 13 - Theoretical basis of AAS - IV
- Lecture 14 - Instrumentation in AAS - I
- Lecture 15 - Instrumentation in AAS - I (Continued...) Radiation Sources
- Lecture 16 - Instrumentation in AAS Radiation Sources
- Lecture 17 - Instrumentation in AAS - III
- Lecture 18 - Instrumentation in AAS - IV
- Lecture 19 - Instrumentation in AAS - V
- Lecture 20 - Instrumentation in AAS - VI
- Lecture 21 - Instrumentation in AAS - VII
- Lecture 22 - Interferences in AAS
- Lecture 23 - Background correction on flame AAS - I
- Lecture 24 - Interferences in AAS - II
- Lecture 25 - Interferences in AAS - III
- Lecture 26 - Hydride Generation AAS - I
- Lecture 27 - Hydride Generation AAS and Cold Vapour Hg AAS
- Lecture 28 - Cold vapor Hg AAS Flame Emission
- Lecture 29 - Mercury cold vapour technique, FAES and Electrothermal AAS

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- Lecture 30 - Electrothermal AAS - II
- Lecture 31 - GF AAS Interferences - I
- Lecture 32 - GF AAS Interferences - II
- Lecture 33 - Interference in ETAAS GF AAS
- Lecture 34 - Individual Elements AAS
- Lecture 35 - Methods, Nomenclature and techniques
- Lecture 36 - Technology and Applications - I
- Lecture 37 - Technology and Applications - II
- Lecture 38 - Conclusions

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

NPTEL Video Course - Chemical Engineering - NOC:Inductive Couple Plasma Atomic Emmission Spectrometry for Pol

Subject Co-ordinator - Dr. J.R. Mudakavi

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Course introduction and atomic structure - I
- Lecture 2 - Course introduction and atomic structure - II
- Lecture 3 - Course introduction and atomic structure - III
- Lecture 4 - Course introduction and atomic structure - IV
- Lecture 5 - Course introduction and atomic structure - V
- Lecture 6 - Course introduction and atomic structure - VI
- Lecture 7 - Nature of electromagnetic radiation
- Lecture 8 - Interaction of EM radiation with matter - I
- Lecture 9 - Interaction of EM radiation with matter - II
- Lecture 10 - Instrumentation for ICP AES - I
- Lecture 11 - Instrumentation for ICP AES - II
- Lecture 12 - Instrumentation for ICP AES - III
- Lecture 13 - Instrumentation for ICP AES - IV - Optical mountings
- Lecture 14 - Instrumentation for ICP AES - V - Detectors
- Lecture 15 - Instrumentation for ICP AES - VI - ICP Torches
- Lecture 16 - Instrumentation for ICP AES - VII - Plasma characteristics
- Lecture 17 - Instrumentation for ICP AES - VIII - Instruments
- Lecture 18 - Practice and Applications of ICP AES - I - Nebulizers
- Lecture 19 - Practice and Applications of ICP AES - II - Sample handling
- Lecture 20 - Practice and Applications of ICP AES - III - Chemical analysis
- Lecture 21 - Practice and Applications of ICP AES - IV - Chemical analysis
- Lecture 22 - Practice and Applications of ICP AES - V - Chemical analysis

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

NPTEL Video Course - Chemical Engineering - NOC:Infrared Spectroscopy for Pollution Monitoring

Subject Co-ordinator - Dr. J.R. Mudakavi

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to Analytical Science and Infrared Spectroscopy
- Lecture 2 - Environmental Analytical Science
- Lecture 3 - Techniques of Elemental Analysis
- Lecture 4 - Atomic Structure - I
- Lecture 5 - Atomic Structure - II
- Lecture 6 - Atomic Structure - III
- Lecture 7 - Atomic Structure - IV
- Lecture 8 - Interaction of electromagnetic radiation with matter - I
- Lecture 9 - Interaction of electromagnetic radiation with matter - II
- Lecture 10 - Interaction of electromagnetic radiation with matter - III
- Lecture 11 - Interaction of electromagnetic radiation with matter - IV
- Lecture 12 - Interaction of electromagnetic radiation with matter - V
- Lecture 13 - Interaction of electromagnetic radiation with matter - VI
- Lecture 14 - Infrared spectroscopy - Introduction
- Lecture 15 - Infra Red Instrumentation
- Lecture 16 - Fourier Transform Infrared Spectroscopy
- Lecture 17 - Sample Handling in IR
- Lecture 18 - Instrumentation in IR
- Lecture 19 - Applications of IR
- Lecture 20 - IR Spectra Interpretation
- Lecture 21 - IR Gas Analysers

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