

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 Appropriation 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 Algebra

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 - 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

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

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 coefficient 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 ?Tm)
- Lecture 24 - Concepts and Basic Principles of Heat Integration - Part 2 (Problem Table Algorithm and Identification of Pinch)
- 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

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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

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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

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

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

- 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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- 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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- 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 Process

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 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

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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

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

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

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

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

- 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

- 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
- 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

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- 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

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

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

- 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 - 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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- 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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- 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 - 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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- 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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- 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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- 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)