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

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

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 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 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

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

Subject Co-ordinator - Prof. Supreet Saini

Co-ordinating Institute - IIT - Bombay

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

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

NPTEL Video Course - Chemical Engineering - NOC:Heat Transfer

Subject Co-ordinator - Prof. Ganesh A. Viswanathan

Co-ordinating Institute - IIT - Bombay

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

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

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

Subject Co-ordinator - Prof. Ganesh Vishwanathan

Co-ordinating Institute - IIT - Bombay

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

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

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

Subject Co-ordinator - Prof. Sujit Jogwar

Co-ordinating Institute - IIT - Bombay

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

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

NPTEL Video Course - Chemical Engineering - NOC:Introduction to Interfacial Waves

Subject Co-ordinator - Prof. Ratul Dasgupta

Co-ordinating Institute - IIT - Bombay

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

Lecture 30 - Linearized wave equations in deep water: dispersion relation
Lecture 31 - Linearised deep-water surface gravity waves (Continued...)
Lecture 32 - Standing and travelling waves in deep water
Lecture 33 - Cauchy-Poisson initial value problem for surface-gravity waves in deep water
Lecture 34 - Cauchy-Poisson problem (Continued...)
Lecture 35 - Cauchy-Poisson problem in cylindrical geometry
Lecture 36 - Cauchy-Poisson problem in cylindrical geometry (Continued...)
Lecture 37 - Group-velocity and the Cauchy-Poisson problem
Lecture 38 - Cauchy-Poisson problem for delta function initial condition
Lecture 39 - Cauchy-Poisson problem for delta function initial condition (Continued...)
Lecture 40 - Capillary-gravity waves
Lecture 41 - Waves on a pool of finite depth
Lecture 42 - Axisymmetric Cauchy-Poisson problem visualisation: the pebble in the deep pond problem
Lecture 43 - Rayleigh-Plateau capillary instability
Lecture 44 - Rayleigh-Plateau capillary instability (Continued...)
Lecture 45 - Rayleigh-Plateau capillary instability on thin film coating a rod
Lecture 46 - Rayleigh-Plateau capillary instability of a cylindrical air column in a liquid
Lecture 47 - Mechanism of the Rayleigh-Plateau instability
Lecture 48 - Shape oscillations of a spherical interface
Lecture 49 - Shape oscillations of a spherical interface (Continued...)
Lecture 50 - Shape oscillations of a spherical interface (Continued...)
Lecture 51 - Analysis of l=0 and l=1 modes for a spherical drop
Lecture 52 - Faraday waves on an interface - stability of time dependent base states
Lecture 53 - Mathieu equation for Faraday waves
Lecture 54 - Applications of Faraday waves - atomisation and spray formation
Lecture 55 - Waves and instability on density stratified shear flows - the KH model
Lecture 56 - Limits of KH dispersion relation: Rayleigh-Taylor instability
Lecture 57 - KH dispersion relation : model of wind wave generation
Lecture 58 - Helmholtz instability of a vortex sheet and summary
Lecture 59 - Derivation of the Stokes travelling wave
Lecture 60 - Derivation of the Stokes travelling wave (Continued...)
Lecture 61 - Derivation of the Stokes travelling wave (Continued...)

NPTEL Video Course - Chemical Engineering - NOC:Hydrogen Energy: Production, Storage, Transportation and Safe

Subject Co-ordinator - Prof. Pratibha Sharma

Co-ordinating Institute - IIT - Bombay

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

Lecture 69 - Utilisation in Different Sectors, Global Status and Future Directions

NPTEL Video Course - Chemical Engineering - NOC:Modeling Stochastic Phenomena for Engineering Applications: P

Subject Co-ordinator - Prof. Yelia Shankaranarayana Mayya

Co-ordinating Institute - IIT - Bombay

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

Lecture 30 - Solution for ultimate winning probability in Gambler's ruin problem
Lecture 31 - Solution to gambler's ruin problem with site dependent jump probabilities
Lecture 32 - Fourier transform method of solving lattice Random walks
Lecture 33 - Two and higher dimensional Random walks
Lecture 34 - Formulating the problem of Probability of Return to the origin
Lecture 35 - Relationship between occupancy probability and first-time-return probability
Lecture 36 - Proof of PolyaÃ¢â ¬â ¢s theorem on the probability of return
Lecture 37 - Return probability estimates in various dimensions and effect of bias in 1-D
Lecture 38 - Dependence of first time return probability (Fk) on steps
Lecture 39 - Equilibrium solutions in lattice random walk models
Lecture 40 - Equilibrium solution to Ehrenfest's flea model
Lecture 41 - Differential equation formulation of stochastic phenomena
Lecture 42 - Derivation of Fokker-Planck equation
Lecture 43 - Generalized transition probability functions for Fokker-Planck equation
Lecture 44 - Solution to 1-D Fokker-Planck equation for free particle: Method of Fourier
Lecture 45 - General non-gaussian solution to translationally invariant Chapman-Kolmogorov
Lecture 46 - Cauchy distribution, power-law and other non-gaussian solutions
Lecture 47 - Wiener process and solution to absorbing barrier problems from Fokker-Planck
Lecture 48 - Application of Fourier Sine transform for single absorber problem
Lecture 49 - Setting up Langevin equation for velocity fluctuations of Brownian particles
Lecture 50 - Understanding the origin of systematic and random parts of force from kinetic
Lecture 51 - Kinetic derivation of a formula for delta-correlated random force
Lecture 52 - Mean square velocity, thermal equilibrium and relationship between relaxation
Lecture 53 - Velocity autocorrelation in Brownian motion
Lecture 54 - Derivation of Stokes-Einstein relationship between diffusion coefficient and
Lecture 55 - Alternative derivation of Stokes-Einstein relationship and Brownian motion with
Lecture 56 - Numerical simulation of the Langevin equation
Lecture 57 - Derivation of Klein-Kramers equation from Langevin equation for joint
Lecture 58 - Illustrative solutions to the Klein-Kramers equation
Lecture 59 - Numerical simulation: Sampling from general distributions and Central
Lecture 60 - Numerical simulation of Random walk trajectories and method of solving Fokker

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

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

Co-ordinating Institute - IIT - Delhi

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

Lecture 30
Lecture 31
Lecture 32
Lecture 33
Lecture 34
Lecture 35
Lecture 36
Lecture 37
Lecture 38
Lecture 39
Lecture 40

NPTEL Video Course - Chemical Engineering - Interfacial Engineering

Subject Co-ordinator - Prof. A.N. Bhaskarwar

Co-ordinating Institute - IIT - Delhi

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

NPTEL Video Course - Chemical Engineering - NOC:Fluid Mechanics and its Applications

Subject Co-ordinator - Prof. Vijay Gupta

Co-ordinating Institute - IIT - Delhi

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

Lecture 30 (14A)
Lecture 31 (15)
Lecture 32 (15A)
Lecture 33 (16)
Lecture 34 (16A)
Lecture 35 (17)
Lecture 36 (17A)
Lecture 37 (18)
Lecture 38 (18A)
Lecture 39 (19)
Lecture 40 (19A)
Lecture 41 (20)
Lecture 42 (20A)
Lecture 43 (20B)
Lecture 44 (21)
Lecture 45 (21A)
Lecture 46 (22)
Lecture 47 (22A)
Lecture 48 (23)
Lecture 49 (23A)
Lecture 50 (24)
Lecture 51 (24A)
Lecture 52 (25)
Lecture 53 (25A)
Lecture 54 (26)
Lecture 55 (26A)
Lecture 56 (25)
Lecture 57 (27)
Lecture 58 (28)
Lecture 59 (28A)
Lecture 60 (29)
Lecture 61 (29A)
Lecture 62 (30)
Lecture 63 (30A)
Lecture 64 (31)
Lecture 65 (31A)

NPTEL Video Course - Chemical Engineering - NOC:Computational Process Design

Subject Co-ordinator - Prof. Manojkumar Ramteke, Prof. Hariprasad Kodamana

Co-ordinating Institute - IIT - Delhi

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

NPTEL Video Course - Chemical Engineering - Heat Transfer

Subject Co-ordinator - Prof. A.K. Ghoshal

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Various types of compact heat exchangers
Lecture 31 - Effectiveness-NTU, method of heat exchanger analysis
Lecture 32 - Design of double pipe heat exchanger
Lecture 33 - Design of shell and tube heat exchanger
Lecture 34 - Introduction to evaporation and evaporators
Lecture 35 - Evaporation principles and evaporator performance
Lecture 36 - Evaporator calculations
Lecture 37 - Introduction to radiation heat transfer
Lecture 38 - Radiation intensity and radiation view factor
Lecture 39 - Radiation heat exchange
Lecture 40 - Radiation shield and gas radiation

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

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

NPTEL Video Course - Chemical Engineering - NOC:Fluidization Engineering

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

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Heat transfer Characteristics
Lecture 31 - Fluidized bed reactor design and its performance

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

Subject Co-ordinator - Dr. Raghvendra Gupta

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Chemical Engineering - NOC:Multiphase Microfluidics

Subject Co-ordinator - Dr. Raghvendra Gupta

Co-ordinating Institute - IIT - Guwahati

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

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

Subject Co-ordinator - Prof. Rajesh Kumar Upadhyay

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction to Multiphase flow Measurement Techniques
Lecture 2 - Invasive and Non-invasive Techniques
Lecture 3 - Hot Wire Anemometry
Lecture 4 - Optical Fiber Probe
Lecture 5 - Laser Doppler Anemometry (LDA)
Lecture 6 - LDA Post Processing and Particle Image Velocimetry (PIV)
Lecture 7 - PIV and Positron Emission Particle Tracking
Lecture 8 - Radioactive Particle Tracking - I
Lecture 9 - Radioactive Particle Tracking - II
Lecture 10 - Capacitance Probe, Optical Fiber Probe and ECT
Lecture 11 - Gamma-ray and X-ray Tomography, MRI
Lecture 12 - Summary

NPTEL Video Course - Chemical Engineering - NOC:Multiphase Flows

Subject Co-ordinator - Prof. Rajesh Kumar Upadhyay

Co-ordinating Institute - IIT - Guwahati

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

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

Subject Co-ordinator - Prof. Amit Kumar

Co-ordinating Institute - IIT - Guwahati

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

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

Subject Co-ordinator - Prof. Pankaj Tiwari

Co-ordinating Institute - IIT - Guwahati

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

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

Subject Co-ordinator - Prof. Sasidhar Gumma

Co-ordinating Institute - IIT - Guwahati

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

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

Subject Co-ordinator - Dr. B. Mandal

Co-ordinating Institute - IIT - Guwahati

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

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

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

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

Subject Co-ordinator - Prof. N. Kishore

Co-ordinating Institute - IIT - Guwahati

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

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

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

Co-ordinating Institute - IIT - Guwahati

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

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

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

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - History, Philosophy and Concept
Lecture 2 - Principle Features
Lecture 3 - Strategies and domain based techniques
Lecture 4 - Intensification by fluid flow process
Lecture 5 - Mechanism of Intensification by mixing
Lecture 6 - Intensification in Reactive system
Lecture 7 - Problems leading to sustainable development
Lecture 8 - Concept, Issues and Challenges
Lecture 9 - Strategies in process design
Lecture 10 - Scales and stages of process intensification
Lecture 11 - Methods and Tools for Achieving sustainable design
Lecture 12 - Multi-level Computer aided tools
Lecture 13 - Introduction on Stochastic Optimization
Lecture 14 - Optimization Algorithms
Lecture 15 - Applications of Optimization Algorithms
Lecture 16 - Introduction and Mechanism of Cavitation-based PI
Lecture 17 - Cavitational Reactor Configurations and activity
Lecture 18 - Parametric effects on cavitation
Lecture 19 - Introduction of monolith reactor
Lecture 20 - Preparation of monolithic catalyst
Lecture 21 - Application of monolithic catalyst
Lecture 22 - Hydrodynamics, transport of monolithic reactor
Lecture 23 - Overview of interfacial area based processes
Lecture 24 - Ejector induced downflow system for PI
Lecture 25 - Hydrodynamics and transport in downflow system
Lecture 26 - Introduction and Principles
Lecture 27 - Types of Intensified Distillation Units
Lecture 28 - Design of membrane-assisted distillation
Lecture 29 - Introduction and Principles

Lecture 30 - Supercritical extraction for process intensification
Lecture 31 - Introduction to membrane and its principles
Lecture 32 - Membrane engineering in process intensification
Lecture 33 - Introduction to microprocess technology
Lecture 34 - Process Intensification by Microreactors
Lecture 35 - Hydrodynamics and transport in microchannel based microreactor

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

Subject Co-ordinator - Dr. B. Mandal

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Reactor Modeling using the RTD

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

Subject Co-ordinator - Dr. Chandan Das

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Basic concepts, Adiabatic saturation temperature
Lecture 2 - Design calculations of cooling tower
Lecture 3 - Design of cooling tower
Lecture 4 - Design of cooling tower
Lecture 5 - Air conditioning, Example problems on dehumidification
Lecture 6 - Mechanism of drying and drying equilibria, drying rate curve
Lecture 7 - Drying
Lecture 8 - Drying
Lecture 9 - Drying time calculation from drying rate curve
Lecture 10 - Introduction to liquid-liquid extraction, liquid-liquid equilibria
Lecture 11 - Effect of temperature on LLE and Design of single stage extraction
Lecture 12 - Design Calculation of Multistage Operation
Lecture 13 - Design calculation of multistage cross-current extraction
Lecture 14 - Design calculation of multistage counter-current extraction, Selection of extractors
Lecture 15 - Leaching
Lecture 16 - Leaching
Lecture 17 - Supercritical Fluid Extraction, equipmet for leaching
Lecture 18 - Fundamentals of membrane separation processes
Lecture 19 - Manufacturing of membranes,advantages and limitations
Lecture 20 - Various models and applications
Lecture 21 - Various models and applications
Lecture 22 - Electric field enhanced membrane separation processes
Lecture 23 - Micellar-enhanced ultrafiltration
Lecture 24 - Adsorption
Lecture 25 - Stage wise and continuous adsorption
Lecture 26 - Fluidized bed and teeter bed
Lecture 27 - Unsteady state fixed bed adsorbers, ion exchange
Lecture 28 - Crystallization, types of crystal geometry
Lecture 29 - Solid-liquid phase equilibrium, Theory of crystallization

Lecture 30 - Design of crystallizer, crystallization equipment

NPTEL Video Course - Chemical Engineering - NOC:Mechanical Unit Operations

Subject Co-ordinator - Prof. Nanda Kishore

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Chemical Engineering - NOC:Advanced Thermodynamics

Subject Co-ordinator - Prof. Nanda Kishore

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Solid-Liquid Equilibrium - 1
Lecture 31 - Solid-Liquid Equilibrium - 2

NPTEL Video Course - Chemical Engineering - NOC:Membrane Technology

Subject Co-ordinator - Prof. Kaustubha Mohanty

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Chemical Engineering - NOC:Computer Aided Applied Single Objective Optimization

Subject Co-ordinator - Prof. Prakash Kotecha

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction to Optimization
Lecture 2 - Linear Regression
Lecture 3 - Multiple, Polynomial and General Linear Least Square Regression
Lecture 4 - Nonlinear Regression
Lecture 5 - Regression
Lecture 6 - Teaching Learning Based Optimization
Lecture 7 - Implementation of TLBO in MATLAB
Lecture 8 - Supplementary
Lecture 9 - Supplementary
Lecture 10 - Particle Swarm Optimization
Lecture 11 - Implementation of Particle Swarm Optimization using MATLAB
Lecture 12 - Differential Evolution
Lecture 13 - Implementation of Differential Evolution using MATLAB
Lecture 14 - Binary Coded Genetic Algorithm
Lecture 15 - Real Coded Genetic Algorithm
Lecture 16 - Implementation of Real Coded Genetic Algorithm using MATLAB
Lecture 17 - Artificial Bee Colony Algorithm
Lecture 18 - Working of Artificial Bee Colony Algorithm
Lecture 19 - Implementation of Artificial Bee Colony using MATLAB
Lecture 20 - Comparison of Variation Operators and Survival Strategies
Lecture 21 - Black-Box Optimization Problems
Lecture 22 - Constraint-Handling in Metaheuristic Techniques
Lecture 23 - Case Study
Lecture 24 - Case Study
Lecture 25 - Parallelization and Vectorization of Fitness Function
Lecture 26 - Constraint-Handling using Correction Approach
Lecture 27 - MATLAB inbuilt functions
Lecture 28 - MATLAB inbuilt functions
Lecture 29 - MATLAB Optimization Tool

Lecture 30 - MATLAB inbuilt functions
Lecture 31 - Simplex Method for LP
Lecture 32 - Branch and Bound Method for MILP
Lecture 33 - MILP formulation of Production Planning Problem
Lecture 34 - Generalized Algebraic Modelling System
Lecture 35 - Solution of Production Planning Problem using GAMS and NEOS, MIRO

NPTEL Video Course - Chemical Engineering - NOC:Basic Principles and Calculations in Chemical Engineering

Subject Co-ordinator - Prof. Subrata Kumar Majumdar

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Definition, History, Role of Chemical Engineer
Lecture 2 - Basic Features of Chemical Process
Lecture 3 - Unit systems and dimensions
Lecture 4 - Variables and Properties of Material in System
Lecture 5 - Pressure and Temperature of Flow Process
Lecture 6 - Rate of Process
Lecture 7 - Principles of material balance and calculation
Lecture 8 - Material Balances on Processes with Recycle and Bypass
Lecture 9 - Material balances on reactive processes
Lecture 10 - Material balances on combustion reactions
Lecture 11 - State Equation of Ideal Gas and Calculation
Lecture 12 - State Equation of non-Ideal Gas and Calculation
Lecture 13 - Phase equilibrium
Lecture 14 - Equilibrium Laws, Humidity and Saturation
Lecture 15 - Humidity, Saturation Psychrometric chart
Lecture 16 - Process of phase change
Lecture 17 - Principles of Energy
Lecture 18 - Laws and properties of thermodynamics
Lecture 19 - Standard Heat of Formation
Lecture 20 - The mechanical energy balance
Lecture 21 - Enthalpy balances without reaction
Lecture 22 - Energy balance with multiplle streams without reaction
Lecture 23 - Energy balance on heat of solution
Lecture 24 - Energy balance with heat of reaction
Lecture 25 - Energy balance with heat of reaction (Continued...)
Lecture 26 - Energy balance with heat of combustion
Lecture 27 - Material balance of transient process
Lecture 28 - Unsteady state energy balance
Lecture 29 - Least Square Method Linear equation fitting

NPTEL Video Course - Chemical Engineering - NOC:Renewable Energy Engineering: Solar, Wind and Biomass Energy

Subject Co-ordinator - Prof. R. Anandalakshmi, Prof. Vaibhav Vasant Goud

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Chemical Engineering - NOC:Biomass Conversion and Biorefinery

Subject Co-ordinator - Prof. Kaustubha Mohanty

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Methanol production and utilization
Lecture 31 - Biomass as feedstock for synthetic organic chemicals, lactic acid, polylactic acid
Lecture 32 - Succinic acid, propionic acid, acetic acid, butyric acid
Lecture 33 - 1,3-propanediol, 2,3-butanedioil, PHA
Lecture 34 - Concept, lignocellulosic biorefinery
Lecture 35 - Aquaculture and algal biorefinery, waste biorefinery
Lecture 36 - Techno-economic evaluation
Lecture 37 - Life-cycle assessment

NPTEL Video Course - Chemical Engineering - NOC:Aspen PlusÂ® Simulation Software - A basic course for beginne

Subject Co-ordinator - Prof. Prabirkumar Saha

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Significance of software with example - Simulation on pen and paper vs simulation on Aspen Plus
Lecture 2 - Understanding Resources and My Exchange, Start using Aspen Plus
Lecture 3 - Overview of setting up of property environment
Lecture 4 - Using Model Pallete - Mixers/Splitters, Separators
Lecture 5 - Using Model Pallete - Exchangers
Lecture 6 - Using Model Pallete - Columns
Lecture 7 - Using Model Palette - Reactors
Lecture 8 - Using Model Palette - Pressure Changers
Lecture 9 - Example: Hydrocarbon Treatment - Part 1
Lecture 10 - Example: Hydrocarbon Treatment - Part 2
Lecture 11 - Setup, Components
Lecture 12 - Property Methods
Lecture 13 - Property Methods and Propeety Sets with example
Lecture 14 - Analysis tools (Pure Components and Binary mixtures)
Lecture 15 - Analysis tools (Ternary mixtures), Data and Regression (Part 1)
Lecture 16 - Data and Regression (Part 2), Property Estimation
Lecture 17 - Practice problems on pure components
Lecture 18 - Practice problems on binary mixtures
Lecture 19 - Miscellaneous practice problems and case studies
Lecture 20 - Model Analysis Tools
Lecture 21 - Separation of Hydrocarbon Mixture
Lecture 22 - Synthesis of Acetaldehyde from Ethanol
Lecture 23 - BTX Separation through Distillation
Lecture 24 - Synthesis of Methanol from Syngas
Lecture 25 - Synthesis of Dimethyl Ether from Carbon Dioxide and Hydrogen
Lecture 26 - Synthesis of Ammonia in Cryogenic Process
Lecture 27 - Production of Cumene
Lecture 28 - Design, Rating and Simulation of Heat Exchanger
Lecture 29 - Absorption and Distillation - Part 1

Lecture 30 - Absorption and Distillation - Part 2
Lecture 31 - Hydrodealkylation of Toluene
Lecture 32 - Isobutene Production Plant
Lecture 33 - Nitric Oxide Production Plant
Lecture 34 - Plant Economy and Utilities
Lecture 35 - Plant Dynamics and Control

NPTEL Video Course - Chemical Engineering - NOC:Physical and Electrochemical Characterizations in Chemical Er

Subject Co-ordinator - Prof. Tamal Banerjee

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction of Characterization Techniques - Part 1
Lecture 2 - Introduction to Characterization Techniques - Part 2
Lecture 3 - Infrared Spectroscopy: Fundamentals
Lecture 4 - Infrared Spectroscopy: IR Bands and Applications
Lecture 5 - Infrared Spectrophotometer Instrumentation
Lecture 6 - Raman Spectroscopy
Lecture 7 - NMR: Concepts and Fundamentalsâ
Lecture 8 - Chemical Shifts
Lecture 9 - Factors Affecting Chemical Shift and 2D NMRâ
Lecture 10 - Physisorption: Surface Area and Pore Analysis
Lecture 11 - Physisorption Measurements
Lecture 12 - Chemisorption
Lecture 13 - Surface Tension and its Measurement - Part 1
Lecture 14 - Surface Tension and its Measurement - Part 2
Lecture 15 - Interfacial Tension and its Application
Lecture 16 - Interfacial Tension and Influence of Surface Curvatureâ
Lecture 17 - Rheology: Fundamentals and Principlesâ
Lecture 18 - Complex Fluids and their Propertiesâ
Lecture 19 - Rheology: Case Study on Hydrogel Synthesis
Lecture 20 - Electron Spectroscopy for Surface Analysisâ
Lecture 21 - Quantification in XRF and XPS Spectroscopyâ
Lecture 22 - XPS Instrument and Applicationâ
Lecture 23 - Introduction to Electrochemical Characterization Techniquesâ
Lecture 24 - Electrode Potential, Kinetics and Mass Transfer Resistanceâ
Lecture 25 - Voltammetry and Galvanostatic Charge-Dischargeâ

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

Subject Co-ordinator - Prof. Tamal Banerjee

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Chemical Engineering - NOC:Inorganic Chemical Technology

Subject Co-ordinator - Prof. Nanda Kishore

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Chemical Engineering - NOC:Organic Chemical Technology

Subject Co-ordinator - Prof. Nanda Kishore

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Chemicals from Aromatic Compounds - Phenol
Lecture 31 - Chemicals from Aromatic Compounds - 3
Lecture 32 - Polymer Industry
Lecture 33 - Polymer Industry - 2
Lecture 34 - Rubber Industry
Lecture 35 - Rubber Industry - 2

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

Subject Co-ordinator - Prof. Subrata Kumar Majumder

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Chemical Engineering - NOC:Energy Conversion Technologies (Biomass and Coal)

Subject Co-ordinator - Prof. Vaibhav V. Goud

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Concept of integration of energy system

NPTEL Video Course - Chemical Engineering - NOC:Petroleum Reservoir Engineering

Subject Co-ordinator - Dr. Pankaj Tiwari

Co-ordinating Institute - IIT - Guwahati

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

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

Subject Co-ordinator - Prof. Tamal Banerjee

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Einstein Model (Continued...)
Lecture 31 - Debye Model
Lecture 32 - Sublimation Pressure and Enthalpy of Crystals
Lecture 33 - Flory Huggin's Model
Lecture 34 - Ising Model
Lecture 35 - Radial Distribution Function
Lecture 36 - Radial Distribution Function
Lecture 37 - Molecular Dynamics Simulations
Lecture 38 - Square well Potential and Barker Henderson Pertubation Theory

NPTEL Video Course - Chemical Engineering - Fluid Mechanics

Subject Co-ordinator - Dr. V. Shankar

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30
Lecture 31
Lecture 32
Lecture 33
Lecture 34
Lecture 35
Lecture 36
Lecture 37
Lecture 38
Lecture 39
Lecture 40

NPTEL Video Course - Chemical Engineering - Mass Transfer II

Subject Co-ordinator - Prof. Nishith Verma

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30
Lecture 31
Lecture 32
Lecture 33
Lecture 34
Lecture 35
Lecture 36
Lecture 37
Lecture 38
Lecture 39
Lecture 40

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

Subject Co-ordinator - Dr. Jayant K. Singh

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Chemical Engineering - NOC:Chemical Engineering Thermodynamics (2019)

Subject Co-ordinator - Dr. Jayant K. Singh

Co-ordinating Institute - IIT - Kanpur

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

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

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 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 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

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

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

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

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 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 Course - Chemical Engineering - NOC:Introduction to Process Modeling in Membrane Separation Proce

Subject Co-ordinator - Prof. S. De

Co-ordinating Institute - IIT - Kharagpur

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

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

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

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

Subject Co-ordinator - Prof. Gargi Das

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Chemical Engineering - NOC:Transport Phenomena

Subject Co-ordinator - Prof. Sunando Dasgupta

Co-ordinating Institute - IIT - Kharagpur

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

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

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

Subject Co-ordinator - Prof. Debasis Sarkar

Co-ordinating Institute - IIT - Kharagpur

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

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

Subject Co-ordinator - Prof. Debasis Sarkar

Co-ordinating Institute - IIT - Kharagpur

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

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

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

Subject Co-ordinator - Prof. Sunando Dasgupta

Co-ordinating Institute - IIT - Kharagpur

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

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

NPTEL Video Course - Chemical Engineering - NOC:Flow through Porous Media

Subject Co-ordinator - Dr. Somnath Ganguly

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Miscible Displacement (Continued...)
Lecture 31 - Miscible Displacement (Continued...)
Lecture 32 - Miscible Displacement (Fractured Porous Media)
Lecture 33 - Miscible Displacement (Viscous Front)
Lecture 34 - Immiscible Flow
Lecture 35 - Immiscible Flow (Continued...)
Lecture 36 - Immiscible Flow (Continued...)
Lecture 37 - Immiscible Flow (Continued...)
Lecture 38 - Immiscible Flow (Continued...)
Lecture 39 - Immiscible Flow (Continued...)
Lecture 40 - Immiscible Flow (Continued...)
Lecture 41 - IMMISCIBLE FLOW (Continued...)
Lecture 42 - Immiscible Flow (Continued...)
Lecture 43 - Immiscible Flow (Continued...)
Lecture 44 - Immiscible Flow (Continued...)
Lecture 45 - Immiscible Flow (Continued...)
Lecture 46 - Immiscible Flow (Continued...)
Lecture 47 - Interception Of Suspended Solids
Lecture 48 - Interception Of Suspended Solids (Continued...)
Lecture 49 - Interception Of Suspended Solids (Continued...)
Lecture 50 - Interception Of Suspended Solids (Continued...)
Lecture 51 - Interception Of Suspended Solids (Continued...)
Lecture 52 - Interception Of Suspended Solids (Continued...)
Lecture 53 - Deformable Porous Media
Lecture 54 - Deformable Porous Media (Continued...)
Lecture 55 - Deformable Porous Media (Continued...)
Lecture 56 - Heat Transfer With Fluid Flow
Lecture 57 - Heat Transfer With Fluid Flow (Continued...)
Lecture 58 - Heat Transfer With Fluid Flow (Continued...)
Lecture 59 - Characterization
Lecture 60 - Characterization (Continued...)

NPTEL Video Course - Chemical Engineering - NOC:Fundamentals of Particle and Fluid Solid Processing

Subject Co-ordinator - Prof. Arnab Atta

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Solid particle characterization
Lecture 2 - Solid particle characterization (Continued...)
Lecture 3 - Particle size distribution
Lecture 4 - Particle size distribution (Continued...)
Lecture 5 - Particle size distribution (Continued...)
Lecture 6 - Fluid - particle mechanics
Lecture 7 - Fluid - particle mechanics (Continued...)
Lecture 8 - Fluid - particle mechanics (Continued...)
Lecture 9 - Fluid - particle mechanics (Continued...)
Lecture 10 - Fluid - particle mechanics (Continued...)
Lecture 11 - Fluid - particle mechanics (Continued...)
Lecture 12 - Fluid - particle mechanics (Continued...)
Lecture 13 - Fluid - particle mechanics (Continued...)
Lecture 14 - Fluid - particle mechanics (Continued...)
Lecture 15 - Fluid - particle mechanics (Continued...)
Lecture 16 - Flow through packed beds
Lecture 17 - Flow through packed beds (Continued...)
Lecture 18 - Flow through packed beds (Continued...)
Lecture 19 - Flow through packed beds (Continued...)
Lecture 20 - Flow through packed beds (Continued...)
Lecture 21 - Fluidization
Lecture 22 - Fluidization (Continued...)
Lecture 23 - Fluidization (Continued...)
Lecture 24 - Fluidization (Continued...)
Lecture 25 - Fluidization (Continued...)
Lecture 26 - Sedimentation
Lecture 27 - Sedimentation (Continued...)
Lecture 28 - Sedimentation (Continued...)
Lecture 29 - Sedimentation (Continued...)

NPTEL Video Course - Chemical Engineering - NOC:Plant Design and Economics

Subject Co-ordinator - Prof. Debasis Sarkar

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Hierarchical Approach to Process Synthesis - IV
Lecture 31 - Basic Reactor Principles
Lecture 32 - Reactor Synthesis for Complex Reactions by Attainable Region
Lecture 33 - Reactor Synthesis for Complex Reactions by Attainable Region
Lecture 34 - Reactor Synthesis for Complex Reactions by Attainable Region
Lecture 35 - General Procedure for Reactor Design and Cost Estimation
Lecture 36 - Introduction to Separation Systems
Lecture 37 - Selection Criteria for Separation Processes
Lecture 38 - Design of Multi-component Distillation Column
Lecture 39 - Design of Multi-component Distillation Column
Lecture 40 - Introduction to Sequencing of Ordinary Distillation Columns
Lecture 41 - Sequences for Simple Nonintegrated Distillation Columns
Lecture 42 - Distillation Sequencing using Columns with Sidestreams
Lecture 43 - Distillation Sequencing using Thermal Coupling
Lecture 44 - Azeotropic Distillation
Lecture 45 - Azeotropic Distillation Methods and Cost Estimation
Lecture 46 - Introduction to Pinch Technology
Lecture 47 - Composite Curves
Lecture 48 - The Problem Table Method
Lecture 49 - The Heat Recovery Pinch and The Grand Composite Curve
Lecture 50 - Heat Exchanger Network Design
Lecture 51 - Introduction
Lecture 52 - Fires and Explosions
Lecture 53 - Fires and Explosions
Lecture 54 - Toxic Release, Hazard Identification and MSDS
Lecture 55 - Inherently Safer Design
Lecture 56 - Optimality Criteria for Unconstrained Functions
Lecture 57 - Examples
Lecture 58 - Equality Constrained Problems
Lecture 59 - Linear Programming Problems
Lecture 60 - Batch Process Scheduling

NPTEL Video Course - Chemical Engineering - NOC:Material and Energy Balance Computations

Subject Co-ordinator - Prof. Arnab Atta

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Single-phase problems and concept of multi-phase system
Lecture 31 - Introduction to Energy Balance - I
Lecture 32 - Introduction to Energy Balance - II
Lecture 33 - Introduction to Energy Balance - III
Lecture 34 - Introduction to Energy Balance - IV
Lecture 35 - Introduction to Energy Balance - V
Lecture 36 - Introduction to Energy Balance - VI
Lecture 37 - Introduction to Energy Balance - VII
Lecture 38 - Introduction to Energy Balance - VIII
Lecture 39 - Introduction to Energy Balance - IX
Lecture 40 - Introduction to Energy Balance - X
Lecture 41 - Introduction to Energy Balance - XI
Lecture 42 - Estimation of Physical Properties - I
Lecture 43 - Estimation of Physical Properties - II
Lecture 44 - Estimation of Physical Properties - III
Lecture 45 - Tutorial - I
Lecture 46 - Tutorial - II
Lecture 47 - Tutorial - III
Lecture 48 - Tutorial - IV
Lecture 49 - Estimation of Physical Parameters - IV
Lecture 50 - Estimation of Physical Parameters - V
Lecture 51 - Energy Balance with Chemical Reactions - I
Lecture 52 - Energy Balance with Chemical Reactions - II
Lecture 53 - Energy Balance with Chemical Reactions - III
Lecture 54 - Energy Balance with Chemical Reactions - IV
Lecture 55 - Energy Balance with Chemical Reactions - V
Lecture 56 - Energy Balance with Chemical Reactions - VI
Lecture 57 - Humidity and Psychrometric Chart - I
Lecture 58 - Humidity and Psychrometric Chart - II
Lecture 59 - Humidity and Psychrometric Chart - III
Lecture 60 - Humidity and Psychrometric Chart - IV

NPTEL Video Course - Chemical Engineering - NOC:Principles and Practices of Process Equipment and Plant Desig

Subject Co-ordinator - Prof. Gargi Das

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Chemical Engineering - NOC:Mathematical Modelling and Simulation of Chemical Engineering

Subject Co-ordinator - Prof. Sourav Mondal

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Demonstration of COMSOL Multiphysics
Lecture 31 - Modelling of multistage distillation process
Lecture 32 - FUG method of stage calculations
Lecture 33 - MESH equations and DOF analysis
Lecture 34 - Tearing method
Lecture 35 - Bubble point method stage calculations
Lecture 36 - Simultaneous correction method
Lecture 37 - Block tridiagonal matrix
Lecture 38 - Simple binary batch distillation
Lecture 39 - Multistage batch distillation
Lecture 40 - Heat exchanger network design pinch analysis
Lecture 41 - Pinch point temperature
Lecture 42 - Heat exchanger network synthesis
Lecture 43 - Solving a distillation column using Aspen plus
Lecture 44 - Solving two unit operations using Aspen Plus
Lecture 45 - Solving multiple units using Aspen Plus
Lecture 46 - Dispersed phase modelling - Introduction
Lecture 47 - Population balance equation
Lecture 48 - Dispersed phase modelling - Breakage process
Lecture 49 - Drop size distribution in lean mixtures
Lecture 50 - Mass transfer in lean liquid-liquid dispersion
Lecture 51 - Dispersed phase modelling - Aggregation
Lecture 52 - Dispersed phase modelling - Aerosol dynamics
Lecture 53 - Dispersed phase modelling - Aerosol dynamics (Continued...)
Lecture 54 - Solution of the population balance equation
Lecture 55 - Numerical solution of the population balance equation
Lecture 56 - Kinetic monte carlo simulation
Lecture 57 - Response surface methodology
Lecture 58 - Design of experiments
Lecture 59 - Artificial neural network
Lecture 60 - Supervised training

NPTEL Video Course - Chemical Engineering - NOC:Advanced Process Dynamics

Subject Co-ordinator - Prof. Parag A. Deshpande

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction and motivation
Lecture 2 - Dynamics of linear first order autonomous systems
Lecture 3 - Dynamics of linear first order autonomous systems (Continued...)
Lecture 4 - Lumped parameter analysis of cooling of a body
Lecture 5 - Lumped parameter analysis of cooling of a body (Continued...)
Lecture 6 - Introduction to higher order systems
Lecture 7 - Phase plane analysis of linear autonomous second order systems
Lecture 8 - Phase plane analysis of linear autonomous second order systems (Continued...)
Lecture 9 - Analysis of a free spring-mass system
Lecture 10 - Analysis of a free spring-mass system (Continued...)
Lecture 11 - Dynamics of non-autonomous systems
Lecture 12 - Similarity solution for non-autonomous higher order dynamics
Lecture 13 - Similarity solution for non-autonomous higher order dynamics (Continued...)
Lecture 14 - Analysis of a forced spring-mass system
Lecture 15 - Analysis of a forced spring-mass system (Continued...)
Lecture 16 - Phase portraits of linear autonomous systems of order three and higher
Lecture 17 - Phase portraits of linear autonomous systems of order three and higher (Continued...)
Lecture 18 - Analysis of complex reaction systems
Lecture 19 - Analysis of complex reaction systems (Continued...)
Lecture 20 - Analysis of complex reaction systems (Continued...)
Lecture 21 - Introduction to non-linear systems
Lecture 22 - Logistic population growth model
Lecture 23 - Logistic population growth model (Continued...)
Lecture 24 - Logistic population growth with harvesting
Lecture 25 - Logistic population growth with harvesting (Continued...)
Lecture 26 - Logistic population growth with threshold population
Lecture 27 - Logistic population growth with threshold population (Continued...)
Lecture 28 - Analysis of population dynamics in discrete domain
Lecture 29 - Analysis of fixed points and bifurcation in discrete domain

Lecture 30 - Analysis of fixed points and bifurcation in discrete domain (Continued...)
Lecture 31 - More on bifurcations in non-linear systems
Lecture 32 - Non-linear systems in higher dimensions
Lecture 33 - Reactor stability analysis
Lecture 34 - Reactor stability analysis (Continued...)
Lecture 35 - Reactor stability analysis (Continued...)
Lecture 36 - Analysis of infectious disease dynamics
Lecture 37 - Analysis of infectious disease dynamics (Continued...)
Lecture 38 - Analysis of infectious disease dynamics (Continued...)
Lecture 39 - Analysis of atmosphere dynamics using Lorenz equations
Lecture 40 - Analysis of atmosphere dynamics using Lorenz equations (Continued...)
Lecture 41 - Analysis of system dynamics in transform domain
Lecture 42 - Analysis of first order system subjected to ideal forcing functions
Lecture 43 - Analysis of first order system subjected to ideal forcing functions (Continued...)
Lecture 44 - Analysis of response of second order systems
Lecture 45 - Analysis of response of second order systems (Continued...)
Lecture 46 - Analysis of (p,q) order systems
Lecture 47 - Analysis of (p,q) order systems (Continued...)
Lecture 48 - Analysis of multiple input - multiple output systems
Lecture 49 - Block diagrams and inter-conversion of state-space and transform domain models
Lecture 50 - Analysis of inverse response systems
Lecture 51 - Analysis of dynamics of discrete-time systems
Lecture 52 - Sampling and reconstruction of continuous signals
Lecture 53 - Conversion of continuous models to discrete-time models
Lecture 54 - Introduction to z-transforms
Lecture 55 - z-transforms Continued
Lecture 56 - Response of discrete-time systems
Lecture 57 - Response of discrete-time systems (Continued...)
Lecture 58 - Response of discrete-time systems (Continued...)
Lecture 59 - Stability analysis in transform domain
Lecture 60 - Review of the course

NPTEL Video Course - Chemical Engineering - NOC:Metallocene and Metal-Carbene based Organometallic Compounds

Subject Co-ordinator - Prof. Sanjib K. Patra

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Chemical Engineering - NOC:Chemical Engineering Fluid Dynamics and Heat Transfer

Subject Co-ordinator - Prof. Rabibrata Mukherjee, Prof. Arnab Atta

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Chemical Engineering - NOC:Characterization of Polymers, Elastomers and Composites

Subject Co-ordinator - Prof. Santanu Chattopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Introduction to Photoacoustic spectroscopy (PA), Raman spectroscopy, Atomic absorption spectrosc
Lecture 31 - NMR Spectroscopy- principles and fundamentals. Application of NMR in polymer, elastomer and comp
Lecture 32 - NMR Spectroscopy- principles and fundamentals. Application of NMR in polymer, elastomer and comp
Lecture 33 - NMR Spectroscopy- principles and fundamentals. Application of NMR in polymer, elastomer and comp
Lecture 34 - NMR Spectroscopy- principles and fundamentals. Application of NMR in polymer, elastomer and comp
Lecture 35 - NMR Spectroscopy- principles and fundamentals. Application of NMR in polymer, elastomer and comp
Lecture 36 - Thermal analysis techniques and application in polymer, elastomer and composites
Lecture 37 - Thermal analysis techniques and application in polymer, elastomer and composites (Continued...)
Lecture 38 - Thermal analysis techniques and application in polymer, elastomer and composites (Continued...)
Lecture 39 - Practical demostration on TGA, DSC and DMA
Lecture 40 - XRD, XPS and XRF. Principles, Fundamentals and Application in Polymer, Elastomer and Composites
Lecture 41 - XRD, XPS and XRF. Principles, Fundamentals and Application in Polymer, Elastomer and Composites
Lecture 42 - XRD, XPS and XRF. Principles, Fundamentals and Application in Polymer, Elastomer and Composites
Lecture 43 - XRD, XPS and XRF. Principles, Fundamentals and Application in Polymer, Elastomer and Composites
Lecture 44 - XRD, XPS and XRF. Principles, Fundamentals and Application in Polymer, Elastomer and Composites
Lecture 45 - Introduction to microscopy (Optical, AFM) with special reference to electron microscopy (SEM, FE
Lecture 46 - Introduction to microscopy (Optical, AFM) with special reference to electron microscopy (SEM, FE
Lecture 47 - Introduction to microscopy (Optical, AFM) with special reference to electron microscopy (SEM, FE
Lecture 48 - Introduction to microscopy (Optical, AFM) with special reference to electron microscopy (SEM, FE
Lecture 49 - Introduction to microscopy (Optical, AFM) with special reference to electron microscopy (SEM, FE
Lecture 50 - Applications of microscopy in polymers, elastomers and composites
Lecture 51 - Applications of microscopy in polymers, elastomers and composites (Continued...)
Lecture 52 - Practical demonstration on optical microscopy
Lecture 53 - Practical demonstration on atomic force microscopy (AFM)
Lecture 54 - Practical demonstration on image processing using standard software (Image)
Lecture 55 - Chromatography, DETA, Quantification from Rate Dependent Methods, Reverse Engineering and Recent
Lecture 56 - Chromatography, DETA, Quantification from Rate Dependent Methods, Reverse Engineering and Recent
Lecture 57 - Chromatography, DETA, Quantification from Rate Dependent Methods, Reverse Engineering and Recent
Lecture 58 - Chromatography, DETA, Quantification from Rate Dependent Methods, Reverse Engineering and Recent
Lecture 59 - Chromatography, DETA, Quantification from Rate Dependent Methods, Reverse Engineering and Recent
Lecture 60 - Chromatography, DETA, Quantification from Rate Dependent Methods, Reverse Engineering and Recent

NPTEL Video Course - Chemical Engineering - NOC:Matlab-Based Programming Lab in Chemical Engineering

Subject Co-ordinator - Prof. Parag A. Deshpande

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Chemical Engineering - NOC:Petroleum Technology

Subject Co-ordinator - Dr. Sonali Sengupta

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Chemical Engineering - NOC:Rheology and Processing of Paints, Plastic and Elastomer Base

Subject Co-ordinator - Prof. Santanu Chattopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Melt Fracture and other ectrudate instabilities
Lecture 31 - Introduction to plastic and rubber mixing and blending
Lecture 32 - Various mixing equipment and their importance
Lecture 33 - Introduction to Two-Roll Mill and Mixing on Two - Roll Mill 1
Lecture 34 - Introduction to Two-Roll Mill and Mixing on Two - Roll Mill 2
Lecture 35 - Introduction to Internel mixture Kneaders and Mixing using Internel mixture and Kneaders
Lecture 36 - Practical demonstration of Rubber mixing on a two roll and using an internal mixer
Lecture 37 - Molding Techniques
Lecture 38 - Calendering
Lecture 39 - Extrusion
Lecture 40 - Rheology of Injection moulding process
Lecture 41 - Plastic and fiber-related processing
Lecture 42 - Numerical problems related to various processing techniques
Lecture 43 - Wire coating, Garvey die, Profile Extrusion
Lecture 44 - Introduction to FEA based computationalfluid mechanics on extrusion - 1
Lecture 45 - Introduction to FEA based computationalfluid mechanics on extrusion - 2
Lecture 46 - Introduction to FEA based computationalfluid mechanics on extrusion - 3
Lecture 47 - Practical demonstartion on FEA
Lecture 48 - Concluding remarks and commentson applied rheology for advanced learners

NPTEL Video Course - Chemical Engineering - NOC:Petroleum Formation Evaluation

Subject Co-ordinator - Dr. Neetish Kumar Maurya, Dr. Sayantan Ghosh

Co-ordinating Institute - IIT-ISM Dhanbad

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

Lecture 30 - Neutron Porosity Log
Lecture 31 - Neutron Porosity Log (Continued...)
Lecture 32 - Neutron Porosity Log (Continued...)
Lecture 33 - Neutron Porosity Log (Continued...)
Lecture 34 - Neutron Porosity Log (Continued...)
Lecture 35 - Sonic (Acoustic) Porosity Log
Lecture 36 - Sonic Porosity Log (Continued...)
Lecture 37 - Sonic Porosity Log (Continued...)
Lecture 38 - Sonic Porosity Log (Continued...)
Lecture 39 - Sonic Porosity Log (Continued...)
Lecture 40 - NMR Log
Lecture 41 - NMR Log (Continued...)
Lecture 42 - Well Log interpretation
Lecture 43 - Well Log interpretation (Continued...)
Lecture 44 - Well Log interpretation (Continued...)
Lecture 45 - Well Log interpretation (Continued...)
Lecture 46 - Well Log Interpretation (Continued...)
Lecture 47 - Well Log Interpretation (Continued...)
Lecture 48 - Well Log Interpretation (Continued...)
Lecture 49 - Well Log Interpretation (Continued...)
Lecture 50 - Well Log Interpretation (Continued...)
Lecture 51 - Formation Evalution (well log analysis) Practical
Lecture 52 - Formation tops and Core Data
Lecture 53 - Formation Temperature and Shaliness
Lecture 54 - Formation porosity and Water Saturation
Lecture 55 - Permeability and Effective Porosity
Lecture 56 - Determination of Archie Equation Parameters
Lecture 57 - Lithology Determination
Lecture 58 - Net Pay and Well Diagram
Lecture 59 - Rock Typing
Lecture 60 - Miscellaneous Topics

NPTEL Video Course - Chemical Engineering - NOC:Momentum Transfer in Fluids

Subject Co-ordinator - Prof. Somenath Ganguly, Prof. Sunando DasGupta

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Basic Equations in Integral Form - 3
Lecture 31 - Complex Potential
Lecture 32 - Complex Potential (Continued...)
Lecture 33 - Complex Potential (Continued...)
Lecture 34 - Complex Potential (Continued...)
Lecture 35 - Complex Potential (Continued...)
Lecture 36 - Basic Equations in Integral Form - 4
Lecture 37 - Basic Equations in Integral Form - 5
Lecture 38 - Basic Equations in Integral Form - 6
Lecture 39 - Bernoulli's Equation Fundamentals - 1
Lecture 40 - Bernoulli's Equation Fundamentals - 2
Lecture 41 - Elements of Fluid Statics and Associated Problems
Lecture 42 - Elements of Fluid Statics and Associated Problems (Continued...)
Lecture 43 - Elements of Fluid Statics and Associated Problems (Continued...)
Lecture 44 - Dimensional Analysis and Similitude
Lecture 45 - Dimensional Analysis and Similitude (Continued...)
Lecture 46 - Bernoulli's Equation Application - 1
Lecture 47 - Bernoulli's Equation Application - 2
Lecture 48 - Bernoulli's Equation Application - 3
Lecture 49 - Bernoulli's Equation Application - 4
Lecture 50 - Bernoulli's Equation Application - 5
Lecture 51 - Bernoulli's Equation Application - 6
Lecture 52 - Flow meters
Lecture 53 - Pumps
Lecture 54 - Recap of Fluid Dynamics
Lecture 55 - Cavitation and Net Positive Suction Head
Lecture 56 - Flow Metaring and Associated Problems
Lecture 57 - Flow Metaring and Associated Problems (Continued...)
Lecture 58 - Flow Metaring and Associated Problems (Continued...)
Lecture 59 - Turbulence
Lecture 60 - Flow Through Porous Media

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 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 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 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; Characteri stics of turbulent flow; Dealing with fluctuations and the concept of tim
Lecture 35 - Derivation of the Reynolds -averaged Navier -Stokes equations; identification of the closure pro
Lecture 36 - Reynol ds stresses in turbulent flow; Time and length scales of turbulence; Energy cascade; Mixi
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 gr
Lecture 41 - Transformation of the governing equations; Illustration for the Laplace equation; Appearance and
Lecture 42 - Finite vol ume method for complicated flow domain; Illustration for the case of flow through a c
Lecture 43 - Finite volume method for the general case
Lecture 44 - Generation of a structured grid for irregular flow domain; Algebraic methods; Elliptic grid gene
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 -locat

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

Subject Co-ordinator - Dr. Arun K.Tangirala

Co-ordinating Institute - IIT - Madras

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

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

NPTEL Video 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 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 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

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

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 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 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

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

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

Subject Co-ordinator - Dr. Arun K.Tangirala

Co-ordinating Institute - IIT - Madras

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

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

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

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

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

Subject Co-ordinator - Dr. Abhijit P. Deshpande

Co-ordinating Institute - IIT - Madras

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

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

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

Subject Co-ordinator - Prof. Ragunathan Rengasamy

Co-ordinating Institute - IIT - Madras

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

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

NPTEL Video Course - Chemical Engineering - System Identification

Subject Co-ordinator - Dr. Arun K.Tangirala

Co-ordinating Institute - IIT - Madras

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

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

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

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

NPTEL Video Course - Chemical Engineering - NOC:Fluid and Particle Mechanics

Subject Co-ordinator - Prof. Basavaraju

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Motion of a Particle in a fluid
Lecture 31 - Brownian motion and electophoresis
Lecture 32 - Sedimentation and Seperation
Lecture 33 - Settling velocity - Stoke's regime and Newton's regime
Lecture 34 - Applications of settling - I
Lecture 35 - Applications of settling - II
Lecture 36 - Colloidal aggregates - Introduction
Lecture 37 - Settling of colloidal aggregates
Lecture 38 - Tutorial 5
Lecture 39 - Settling of colloidal aggregates - free settling
Lecture 40 - Settling in Multiple Particles System
Lecture 41 - Flow Through Packed Bed
Lecture 42 - Pressure Drop Through Packed Bed
Lecture 43 - Tutorial 6
Lecture 44 - Pressure Droped Through Packed bed Continue
Lecture 45 - Fluidized Bed - 1
Lecture 46 - Fluidized Bed - 2
Lecture 47 - Filtration - 1
Lecture 48 - Filtration - 2
Lecture 49 - Tutorial 7
Lecture 50 - Laminar and Turbulent Flows - 1
Lecture 51 - Laminar and Turbulent Flows - 2
Lecture 52 - Laminar and Turbulent Flows - 3
Lecture 53 - Turbulent Stress and Turbulent Shear Layer
Lecture 54 - Turbulent Flow near a wall and in a pipe
Lecture 55 - Effect of rough Walls
Lecture 56 - Roughness in Turbulent Pipe Flow
Lecture 57 - Pipes of non-circular cross section
Lecture 58 - Minnor Losses, Sudden Expansion and Contraction
Lecture 59 - Friction Losses in Sudden Expansion
Lecture 60 - Tutorial 8
Lecture 61 - Momentum and Kinetic Energy Correction Factor
Lecture 62 - pressure drop in pipes which connected in series
Lecture 63 - Pressure Drop in Pipes Which Connected in Parallel
Lecture 64 - Pressure Drop in Pipes Which Connected at Junction
Lecture 65 - Boundary Layer
Lecture 66 - Boundary Layer - Momentum Integral Analysis - 1
Lecture 67 - Boundary Layer - Momentum Integral Analysis - 2
Lecture 68 - Boundary Layer - Differential Approach

Lecture 69 - Laminar and Turbulent Boundary Layer
Lecture 70 - Tutorial 9

NPTEL Video Course - Chemical Engineering - NOC:Continuum Mechanics and Transport Phenomena

Subject Co-ordinator - Prof. T. Renganathan

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Integral linear momentum balance - Part 2
Lecture 31 - Integral linear momentum balance : Examples - Part 1
Lecture 32 - Integral linear momentum balance : Examples - Part 2
Lecture 33 - Integral linear momentum balance : Examples - Part 3
Lecture 34 - Differential linear momentum balance : Introduction
Lecture 35 - Differential linear momentum balance : Transient, convection and body force terms
Lecture 36 - Stress vector - Part 1
Lecture 37 - Stress vector - Part 2
Lecture 38 - Stress tensor - Part 1
Lecture 39 - Stress tensor - Part 2
Lecture 40 - Cauchy's formula
Lecture 41 - Components of Stress Vector : Example
Lecture 42 - Properties of stress tensor - Part 1
Lecture 43 - Properties of stress tensor - Part 2
Lecture 44 - Total stress tensor for fluids
Lecture 45 - Comparison of solids and fluids
Lecture 46 - Fluids at rest
Lecture 47 - Differential linear momentum balance : Surface force terms
Lecture 48 - Differential linear momentum balance : All terms
Lecture 49 - Convective momentum flux tensor
Lecture 50 - Differential linear momentum balance : Closure problem
Lecture 51 - Normal Strain and Shear Strain - Part 1
Lecture 52 - Normal Strain and Shear Strain - Part 2
Lecture 53 - Displacement Field and Displacement Gradient - Part 1
Lecture 54 - Displacement Field and Displacement Gradient - Part 2
Lecture 55 - Strain Displacement Gradient Relation : Example
Lecture 56 - Strain Displacement Gradient Relation : Normal and shear strain
Lecture 57 - Strain Displacement Gradient Relation : Rotation and volumetric strain
Lecture 58 - Strain Displacement Gradient Relation : Examples
Lecture 59 - Displacement Gradient Tensor
Lecture 60 - Components of Total Displacement - Part 1
Lecture 61 - Components of Total Displacement - Part 2
Lecture 62 - Strain Tensor and Rotation Tensor - Part 1
Lecture 63 - Components of Total Displacement : Example
Lecture 64 - Normal and Shear Strain Rate
Lecture 65 - Strain Rate Velocity Gradient Relation
Lecture 66 - Volumetric Strain Rate
Lecture 67 - Velocity Gradient Tenso
Lecture 68 - Strain Rate : Example 1

Lecture 69 - Strain Rate : Example 2
Lecture 70 - Stress Strain Relation : Introduction
Lecture 71 - Material Properties
Lecture 72 - Hookeâ s Law - Strain-stress Relation
Lecture 73 - Relation Between Material Properties
Lecture 74 - Hookeâ s Law - Stress-strain Relation
Lecture 75 - Hookeâ s Law : Examples
Lecture 76 - Stress Strain Rate Relation : Introduction
Lecture 77 - Newtonâ s Law of Viscosity : 1D Form
Lecture 78 - Newtonâ s Law of Viscosity : 3D Form
Lecture 79 - Navier Stokes Equation
Lecture 80 - Fluid at Rest : Pressure Distribution
Lecture 81 - Hydrostatic Pressure Distribution in Liquid
Lecture 82 - Hydrostatic Pressure Distribution in Gas
Lecture 83 - Fluid in Rigid Body Motion : Pressure Distribution
Lecture 84 - Flow Regimes : Laminar and Turbulent flow
Lecture 85 - Euler Equation
Lecture 86 - Bernoulli Equation : Inviscid Flow
Lecture 87 - Bernoulli Equation : Example 1
Lecture 88 - Bernoulli Equation : Irrotational Flow
Lecture 89 - Bernoulli Equation : Example 2
Lecture 90 - Planar Couette Flow - Governing Equations
Lecture 91 - Planar Couette Flow - Velocity and Pressure Distribution
Lecture 92 - Planar Couette Flow - Shear Force
Lecture 93 - Planar Poiseuille Flow : Governing Equations
Lecture 94 - Planar Poiseuille Flow : Velocity and Pressure Distribution
Lecture 95 - Planar Poiseuille Flow : Shear force
Lecture 96 - Planar Poiseuille Flow : Shear Stress Distribution
Lecture 97 - Viscous Stress vs. Molecular Momentum Flux - Part 1
Lecture 98 - Viscous Stress vs. Molecular Momentum Flux - Part 2
Lecture 99 - Linear Momentum Balance : Fluid Mechanics vs. Momentum Transport - Part 1
Lecture 100 - Linear Momentum Balance : Fluid Mechanics vs. Momentum Transport - Part 2
Lecture 101 - Viscous Stress vs. Molecular Momentum Flux - Part 3
Lecture 102 - Integral Energy Balance - Part 1
Lecture 103 - Integral Energy Balance - Part 2
Lecture 104 - Simplification of Integral Energy Balance
Lecture 105 - Integral Energy Balance : Examples
Lecture 106 - Differential Energy Balance : Introduction
Lecture 107 - Differential Total Energy Balance - Part 1

NPTEL Video Course - Chemical Engineering - NOC:Environmental Quality Monitoring and Analysis

Subject Co-ordinator - Dr. R. Ravi Krishna

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Chemical Engineering - Synthetic and Natural Supramolecular Architectures: An Approach T

Subject Co-ordinator - Prof. ChebroluPulla Rao

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Chemical Engineering - NOC:Artificial Lift

Subject Co-ordinator - Prof. Abdus Samad

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - SRP-Pump performance analysis - Part 3
Lecture 31 - Introduction to progressive cavity punp
Lecture 32 - Progressive cavity Pump - Part 1
Lecture 33 - Progressive cavity Pump - Part 2
Lecture 34 - Progressive cavity Pump - Part 3
Lecture 35 - Progressive cavity Pump - Part 4
Lecture 36 - Progressive cavity Pump - Part 5
Lecture 37 - Electric submersible pump - Part 1
Lecture 38 - Electric submersible pump - Part 2
Lecture 39 - Electric submersible pump - Part 3
Lecture 40 - ESP- basic electrical systems - Part 1
Lecture 41 - ESP- basic electrical systems - Part 2
Lecture 42 - ESP- basic electrical systems - Part 3
Lecture 43 - ESP- numerical problems - Part 1
Lecture 44 - ESP- numerical problems - Part 2
Lecture 45 - ESP- numerical problems - Part 3
Lecture 46 - ESP- numerical problems - Part 1
Lecture 47 - ESP- numerical problems - Part 2
Lecture 48 - Gas lift basics - Part 1
Lecture 49 - Gas lift basics - Part 2
Lecture 50 - Gas lift valves and installartion - Part 1
Lecture 51 - Gas lift valves and installartion - Part 2
Lecture 52 - Plunger lift and design
Lecture 53 - Hydraulic jet pump fundamentals - Part 1
Lecture 54 - Hydraulic jet pump fundamentals - Part 2
Lecture 55 - Hydraulic engine pumps and design - Part 1
Lecture 56 - Hydraulic engine pumps and design - Part 2
Lecture 57 - Surface pump units for jet pump - Part 1
Lecture 58 - Surface pump units for jet pump - Part 2
Lecture 59 - Surface pump units for jet pump - Part 3
Lecture 60 - Surface compressor for gas lift - Part 1
Lecture 61 - Surface compressor for gas lift - Part 2
Lecture 62 - Surface compressor for gas lift - Part 3

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 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 - Polymides or Nylons(PA)
Lecture 36 - DMT and Terephtalic Acid, Polyester, PET resin, PTB resin
Lecture 37 - Acrylic Fibre, Modified Acrylic Fibre, Acrylonitrile, Acrolein, Propylene Finber, Polyurethane
Lecture 38 - Viscose Rayon and Acetate rayon
Lecture 39 - Pesticide
Lecture 40 - Dye and Intermediates

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 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 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

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

Subject Co-ordinator - Prof. P. Mondal

Co-ordinating Institute - IIT - Roorkee

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

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

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

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

Subject Co-ordinator - Prof. Shabina Khanam

Co-ordinating Institute - IIT - Roorkee

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

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

Subject Co-ordinator - Prof. Prateek Kumar Jha

Co-ordinating Institute - IIT - Roorkee

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

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

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

Subject Co-ordinator - Prof. Shabina Khanam

Co-ordinating Institute - IIT - Roorkee

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

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

Subject Co-ordinator - Dr. Shishir Sinha

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - General Design Methods to prevent Fire
Lecture 31 - Sprinklers - I
Lecture 32 - Sprinklers - II
Lecture 33 - Introduction to Reliefs
Lecture 34 - Type of Reliefs
Lecture 35 - Relief Scenario
Lecture 36 - Relief Sizing
Lecture 37 - Hazard and Hazard Identification
Lecture 38 - Hazard Identification Methods and HAZOP
Lecture 39 - Safety Reviews and Risk Assessment - I
Lecture 40 - Risk Assessment - II
Lecture 41 - Review of Probability Theory
Lecture 42 - Event Trees
Lecture 43 - Fault Trees
Lecture 44 - Cause Consequence Analysis and Layer of Protection Analysis
Lecture 45 - Bow-Tie Analysis
Lecture 46 - Accident Research
Lecture 47 - Accident Causation Theories
Lecture 48 - Accident Investigation Procedure - I
Lecture 49 - Accident Investigation Procedure - II
Lecture 50 - Jaipur Terminal Fire, India
Lecture 51 - The Flixborough UK, Cyclohexane Disaster
Lecture 52 - Seveso Accident
Lecture 53 - The Chernobyl Nuclear Disaster
Lecture 54 - Bhopal Gas Tragedy
Lecture 55 - Bhopal Gas Tragedy
Lecture 56 - Nuclear Radiation
Lecture 57 - Process Safety Management
Lecture 58 - Personal Protective Equipments
Lecture 59 - Safety
Lecture 60 - Nuclear Disaster

NPTEL Video Course - Chemical Engineering - NOC:Technologies for Clean and Renewable Energy Production

Subject Co-ordinator - Prof. P. Mondal

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Tutorial 6
Lecture 31 - Hydro Energy - 1
Lecture 32 - Hydro Energy - 2
Lecture 33 - Geothermal Energy
Lecture 34 - Tidal Energy
Lecture 35 - Tutorial 7
Lecture 36 - Energy from Biomass and Wastes 1 (Biological Route)
Lecture 37 - Energy from Biomass and Wastes 2 (Chemical Route)
Lecture 38 - Energy from Biomass and Wastes 3 (Physical Route)
Lecture 39 - Energy Conversations
Lecture 40 - Tutorial 8

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

Subject Co-ordinator - Prof. Shishir Sinha

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Step Growth Polymerization - III
Lecture 31 - Step Growth Polymerization - IV
Lecture 32 - Radical Chain Polymerization Introduction
Lecture 33 - Radical Chain Polymerization Comparison with Ionic Chain Polymerization
Lecture 34 - Radical Chain Polymerization Mode of Propagation
Lecture 35 - Radical Chain Polymerization Rate of Polymerization
Lecture 36 - Radical Chain Polymerization Rate Expression
Lecture 37 - Radical Chain Polymerization Process Analysis - I
Lecture 38 - Radical Chain Polymerization Process Analysis - II
Lecture 39 - Radical Chain Polymerization Half-life, Propagation and Termination - I
Lecture 40 - Radical Chain Polymerization Half-life, Propagation and Termination - II
Lecture 41 - Radical Chain Polymerization Redox Initiation
Lecture 42 - Radical Chain Polymerization Photochemical and Ionization Initiation
Lecture 43 - Radical Chain Polymerization Other Initiation Techniques - I
Lecture 44 - Radical Chain Polymerization Other Initiation Techniques - II
Lecture 45 - Heterogeneous Polymerization Introduction - I
Lecture 46 - Heterogeneous Polymerization Introduction - II
Lecture 47 - Population Balance Modeling Other Techniques - I
Lecture 48 - Population Balance Modeling Other Techniques - II
Lecture 49 - Emulsion Polymerization Batch Polymerization
Lecture 50 - Emulsion Polymerization Semi-continuous polymerization
Lecture 51 - Emulsion Polymerization Nucleation, Morphology and Reactor Types - I
Lecture 52 - Emulsion Polymerization Nucleation, Morphology and Reactor Types - II
Lecture 53 - Emulsion Polymerization PSD and Implementation of the Process - I
Lecture 54 - Emulsion Polymerization PSD and Implementation of the Process - II
Lecture 55 - Living and dormant Polymerization
Lecture 56 - Ionic Polymerization - I
Lecture 57 - Ionic Polymerization - II
Lecture 58 - Ionic Polymerization - III
Lecture 59 - Ionic Polymerization - IV
Lecture 60 - Ionic Polymerization - V

NPTEL Video Course - Chemical Engineering - NOC:Process Equipment Design

Subject Co-ordinator - Prof. Shabina Khanam

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Design of Reboiler - 4
Lecture 31 - Design of Reboiler - 5
Lecture 32 - Design of Reboiler - 6
Lecture 33 - Design of Reboiler - 7
Lecture 34 - Design of Evaporator - 1
Lecture 35 - Design of Evaporator - 2
Lecture 36 - Design of Evaporator - 3
Lecture 37 - Design of Evaporator - 4
Lecture 38 - Design of Evaporator - 5
Lecture 39 - Design of Crystallizer - 1
Lecture 40 - Design of Crystallizer - 2
Lecture 41 - Design of Crystallizer - Examples
Lecture 42 - Design of Crystallizer - Types
Lecture 43 - Design of Packed Column - 1
Lecture 44 - Design of Packed Column - 2
Lecture 45 - Design of Packed Column - 3
Lecture 46 - Design of Packed Column - 4
Lecture 47 - Design of Packed Column - 5
Lecture 48 - Distillation Column - 1
Lecture 49 - Distillation Column - 2
Lecture 50 - Distillation Column - 3
Lecture 51 - Distillation Column - 4
Lecture 52 - Distillation Column - 5
Lecture 53 - Distillation Column - 6
Lecture 54 - Distillation Column - 7
Lecture 55 - Distillation Column - 8
Lecture 56 - Distillation Column - Mechanical Design - 1
Lecture 57 - Distillation Column - Mechanical Design - 2
Lecture 58 - Distillation Column - Mechanical Design - 3
Lecture 59 - Distillation Column - Mechanical Design - 4
Lecture 60 - Distillation Column - Mechanical Design - 5

NPTEL Video Course - Chemical Engineering - NOC:Advanced Thermodynamics and Molecular Simulations

Subject Co-ordinator - Prof. Prateek Kumar Jha

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Theoretical basis of molecular dynamics simulation
Lecture 31 - Interaction energy and force field
Lecture 32 - Liouiville theorem; theoretical basis of Monte Carlo simulation
Lecture 33 - Introduction to Monte Carlo simulation method
Lecture 34 - Markov chain algorithm, condition for equilibrium and detailed balance
Lecture 35 - Metropolis algorithm, periodic boundary condition
Lecture 36 - Numerical implementation of Monte Carlo simulation: Python Examples - I
Lecture 37 - Numerical implementation of Monte Carlo simulation: Python Examples - II
Lecture 38 - Numerical implementation of Monte Carlo simulation: Python Examples - III
Lecture 39 - Numerical implementation of Monte Carlo simulation: Python Examples - IV
Lecture 40 - Numerical implementation of Monte Carlo simulation: Python Examples - V
Lecture 41 - Particle simulations: comparison with quantum chemical and continuum simulations; bridging lengt
Lecture 42 - Pair potentials
Lecture 43 - Saving CPU time: short range and long range interactions
Lecture 44 - Bonded and non-bonded interactions, force fields
Lecture 45 - Practical aspects of molecular simulations
Lecture 46 - Numerical implementation of MD; thermostat and barostat
Lecture 47 - MD simulations - efficiency and parallelization, sampling and averaging, analysis of simulation
Lecture 48 - MD simulations - analysis of simulation trajectories (continued), Case Studies - I
Lecture 49 - MD simulations - Case Studies - II
Lecture 50 - MD simulations - Case Studies - III
Lecture 51 - Free energies and phase behavior; extension of canonical ensemble Monte Carlo to other ensembles
Lecture 52 - Extension of canonical ensemble Monte Carlo to other ensembles (Continued...)
Lecture 53 - Monte Carlo in Gibbs ensemble and semi-grand canonical ensemble, thermodynamic integration
Lecture 54 - Thermodynamic integration (continued); Widom's particle insertion; overlapping distribution meth
Lecture 55 - Multiple histogram method; umbrella sampling; thermodynamic cycle; potential of mean force; pull
Lecture 56 - Tackling time scale issues (continued); nonequilibrium molecular dynamics; mesoscale simulations
Lecture 57 - Multiparticle collision dynamics; lattice Boltzmann method; coarse-graining
Lecture 58 - Case studies
Lecture 59 - Simulations of chemical reactions using Kinetic Monte Carlo simulations
Lecture 60 - Reactive force fields; Ab initio molecular dynamics and other advanced methods; molecular simula

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

Subject Co-ordinator - Prof. Shishir Sinha

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Insulation of Steam Generators
Lecture 31 - Air
Lecture 32 - Air Filtration and Pneumatic Conveying
Lecture 33 - Introduction to Pneumatic Conveying System
Lecture 34 - Conveying System Types
Lecture 35 - Material Properties and Pipeline Feeding Devices
Lecture 36 - Feeding devices
Lecture 37 - Gas-solid flows
Lecture 38 - Design of Pipelines Elements of Pipeline Design
Lecture 39 - Natural Gas Transmission - I
Lecture 40 - Natural Gas Transmission - II
Lecture 41 - Natural Gas Transmission - III
Lecture 42 - Pipeline Mechanical design - Natural Gas Transmission - IV
Lecture 43 - Cooling Tower; Theory and Some Basic Calculations
Lecture 44 - Concept of Heat Transfer in Cooling Tower and itâ s Components
Lecture 45 - Types and Components of Cooling Tower
Lecture 46 - Components and Materials of Construction and Applications of Cooling Tower
Lecture 47 - Control and Maintenance in cooling towers
Lecture 48 - Pressure Levels and Terminology - I
Lecture 49 - Pressure Levels and Terminology - II
Lecture 50 - Gauges for Pressure Measurement
Lecture 51 - Refrigerants and Refrigeration
Lecture 52 - Introduction to Refrigeration
Lecture 53 - Refrigeration System Components
Lecture 54 - Refrigeration System Components and Refrigeration Cycle
Lecture 55 - Refrigeration Systems
Lecture 56 - Refractories
Lecture 57 - Thermodynamic Principles and Corrosion in Refractories
Lecture 58 - Slag Attack and Kinds of Refractories in Uses
Lecture 59 - Brief history of Insulations and itâ s fundamental principles
Lecture 60 - Heat transfer in Insulations materials

NPTEL Video Course - Chemical Engineering - NOC:Physico-Chemical Processes for Waste Water Treatment

Subject Co-ordinator - Prof. Vimal Chandra Srivastava

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Filtration - III
Lecture 31 - Adsorption - I
Lecture 32 - Adsorption - II
Lecture 33 - Adsorption - III
Lecture 34 - Adsorption - IV
Lecture 35 - Adsorption - V
Lecture 36 - Adsorption - VI
Lecture 37 - Ion-exchange - I
Lecture 38 - Ion-exchange - II
Lecture 39 - Ion-exchange - III
Lecture 40 - Ion-exchange - IV
Lecture 41 - Wastewater treatment by membrane processes - I
Lecture 42 - Wastewater treatment by membrane processes - II
Lecture 43 - Wastewater treatment by membrane processes - III
Lecture 44 - Wastewater treatment by membrane processes - IV
Lecture 45 - Wastewater treatment by membrane processes - V
Lecture 46 - Advanced Oxidation Processes (AOP) - Introduction
Lecture 47 - AOP - Photocatalytic wastewater treatment
Lecture 48 - AOP - Fenton, ozone and catalytic treatment
Lecture 49 - AOP - Electrochemical wastewater treatment - I
Lecture 50 - AOP - Electrochemical wastewater treatment - II
Lecture 51 - AOP - Sono-hybrid wastewater treatment
Lecture 52 - Disinfection - I
Lecture 53 - Disinfection - II
Lecture 54 - Disinfection - III
Lecture 55 - Case Study - Wastewater treatment in sugar industry
Lecture 56 - Case Study - Wastewater treatment in distillery
Lecture 57 - Case Study - Wastewater treatment in fertilizer industry
Lecture 58 - Case Study - Wastewater treatment in petroleum refining industry
Lecture 59 - Case Study - Common effluent treatment plant (CETP)
Lecture 60 - Choice of technology and summary

NPTEL Video Course - Chemical Engineering - NOC:Basic Environmental Engineering and Pollution Abatement

Subject Co-ordinator - Prof. P. Mondal

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Tutorial-6
Lecture 31 - Secondary treatment equipment - 1
Lecture 32 - Secondary treatment equipment - 2
Lecture 33 - Advanced secondary processes - 1
Lecture 34 - Advanced secondary processes - 2
Lecture 35 - Tutorial-7
Lecture 36 - Advanced secondary processes - 3
Lecture 37 - Tertiary treatment - 1
Lecture 38 - Tertiary treatment - 2
Lecture 39 - Tertiary treatment - 3
Lecture 40 - Tutorial-8
Lecture 41 - Sludge management - 1
Lecture 42 - Sludge management - 2
Lecture 43 - Sludge management - 3
Lecture 44 - Industrial Pollution Control in GPI - 1 (General aspect and pollution control in sugar industry)
Lecture 45 - Tutorial-9
Lecture 46 - Industrial Pollution Control in GPI - 2 (Pollution control in Distillery)
Lecture 47 - Industrial Pollution Control in GPI - 3 (Pollution control in Tannery)
Lecture 48 - Pollution control in Petroleum refinery and petrochemicals industry
Lecture 49 - Industrial Pollution Control in GPI - 4
Lecture 50 - Tutorial 10
Lecture 51 - Solid waste and hazardous waste management - 1
Lecture 52 - Solid waste and hazardous waste management - 2
Lecture 53 - Solid waste and hazardous waste management - 3
Lecture 54 - Solid waste and hazardous waste management - 4
Lecture 55 - Tutorial-11
Lecture 56 - Air Pollution Management, Air quality survey, NAAQI - 1
Lecture 57 - Air Pollution Management, Air quality survey, NAAQI - 2
Lecture 58 - Management of special category wastes - 1
Lecture 59 - Management of special category wastes - 2
Lecture 60 - Tutorial-12

NPTEL Video Course - Chemical Engineering - NOC:Biological Process Design for Wastewater Treatment

Subject Co-ordinator - Prof. Vimal Chandra Srivastava

Co-ordinating Institute - IIT - Roorkee

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

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

Subject Co-ordinator - Prof. Taraknath Das

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction
Lecture 2 - Introduction_Various Reactors_BR
Lecture 3 - Design Equation_Continuous reactor (CSTR_PFR_PBR)
Lecture 4 - Design Equation_Continuous reactor (CSTR_PFR_PBR)_Sizing
Lecture 5 - Reaction Rate with Conversion, Temperature, and pressure (Batch/Flow system)
Lecture 6 - Space time Space velocity and CSTRs in series/parallel
Lecture 7 - Effect of Pressure Drop on reactor design (PBR)_(X vs W) and (P vs W)
Lecture 8 - Effect of Pressure Drop on Reactor design (PBR)_(X vs W)_ (P vs W)
Lecture 9 - Effect of Pressure Drop in PBR reactor_Analytical solution of Differential equation
Lecture 10 - Effect of Pressure Drop in PBR reactor_Analytical solution for Reaction With Pressure drop
Lecture 11 - Effect of Pressure Drop in PBR reactor_Example
Lecture 12 - Differential Reactor_rate of reaction_catalyst deactivation
Lecture 13 - Catalyst deactivation
Lecture 14 - Catalyst Deactivation_Temperature (T) - Time (t) trajectories
Lecture 15 - Moving Bed Reactor_Catalyst deactivation
Lecture 16 - STTR_Catalyst deactivation
Lecture 17 - Multi phase reactors-1: Slurry reactor - 1
Lecture 18 - Multi phase reactors-1: Slurry reactor - 2
Lecture 19 - Multi phase reactors-1: Slurry reactor - 3
Lecture 20 - Multi phase reactors-2: Trickle bed reactor - 1
Lecture 21 - Multi phase reactors-2: Trickle bed reactor - 2
Lecture 22 - Multi phase reactors-2: Trickle bed reactor - 3
Lecture 23 - Bioreactor_Cell Growth and Rate laws
Lecture 24 - Bioreactors_Stoichiometry_Yield coefficients_rate of substrate consumption
Lecture 25 - Bioreactors_Example_Yield coefficients and rate law parameters estimation
Lecture 26 - Bioreactors_Mass Balances (Cell, Substrate, Product)
Lecture 27 - Bioreactors_Chemostats
Lecture 28 - Steady State Non Isothermal reactor design_EB equation
Lecture 29 - Steady State Non Isothermal reactor design_Example

Lecture 30 - SS Non Isothermal reactor design_Reaction with Heat Exchange
Lecture 31 - SS Non Isothermal reactor design_Heat Exchange_ T-profile for a few cases
Lecture 32 - SS Non Isothermal reactor design_Equilibrium conversion
Lecture 33 - SS Non Isothermal reactor design_Optimum feed temperature
Lecture 34 - SS Non Isothermal reactor design_Multiple Steady States
Lecture 35 - SS Non Isothermal reactor design_Ignition Extinction Curves
Lecture 36 - SS Non Isothermal reactor design_Runaway reaction in a CSTR
Lecture 37 - SS Non Isothermal reactor design_Energy Balance:Multiple rxn in a CSTR/PFR (Examples)
Lecture 38 - Non-ideal flow - 1
Lecture 39 - Basics of Non-ideal flow - 2
Lecture 40 - Basics of Non-ideal flow - 3
Lecture 41 - Non-ideal flow-Segregation model
Lecture 42 - One parameter Model-Tank in Series model (TIS)
Lecture 43 - Non-ideal flow-Dispersion model - Part 1
Lecture 44 - Non-ideal flow-Dispersion model - Part 2
Lecture 45 - Non-ideal flow-Dispersion model - Part 3
Lecture 46 - Two parameter Models-Modeling real reactors with Combinations of Ideal Reactors
Lecture 47 - Solid Catalyzed Reaction: Reaction and Diffusion - Part 1
Lecture 48 - Solid Catalyzed Reaction: Reaction and Diffusion - Part 2
Lecture 49 - Solid Catalyzed Reaction: Reaction and Diffusion - Part 3
Lecture 50 - Catalysis and Catalytic Reactors - Part 1
Lecture 51 - Catalysis and Catalytic Reactors - Part 2
Lecture 52 - Catalysis and Catalytic Reactors - Part 3
Lecture 53 - Collection and Analysis of Rate - Part 1
Lecture 54 - Collection and Analysis of Rate - Part 2
Lecture 55 - Collection and Analysis of Rate - Part 3
Lecture 56 - Polymath and ODE solver
Lecture 57 - Catalyst Synthesis - Part 1
Lecture 58 - Catalyst Synthesis - Part 2
Lecture 59 - Catalyst Characterization Techniques: BET, Pore size, Pore volume
Lecture 60 - Catalyst Characterization Techniques

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

Subject Co-ordinator - Prof. Shishir Sinha

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Chemical reaction engineering in polymers: Addition (Chain-Growth) Polymerization - III
Lecture 31 - Injection Moulding - 1
Lecture 32 - Injection Moulding - 2
Lecture 33 - Extrusion
Lecture 34 - Blow moulding
Lecture 35 - Calendaring and Fiber spinning
Lecture 36 - Polymer Testing - 1
Lecture 37 - Polymer testing - 2 (Standardization, Sample preparation)
Lecture 38 - Polymer testing - 3
Lecture 39 - Polymer testing - 4 (Measuring of rheological properties)
Lecture 40 - Polymer testing - 5 (Mechanical properties; Hardness, tensile and compression)
Lecture 41 - Polymer testing - 6
Lecture 42 - Polymer Testing - 7
Lecture 43 - Polymer Testing - 8
Lecture 44 - Polymer Testing - 9
Lecture 45 - Polymer Testing - 10
Lecture 46 - Polymeric Materials Used in Electronics
Lecture 47 - Polymers in Electronics: Epoxies
Lecture 48 - Epoxies, Phenoxies, and Silicones
Lecture 49 - Polyimides
Lecture 50 - Fluorocarbons, Polyxylyenes, and Polyesters
Lecture 51 - Polymer Materials in Electronics
Lecture 52 - Functions of Coatings - I
Lecture 53 - Functions of Coatings - II
Lecture 54 - Natural fibers reinforced composites - I
Lecture 55 - Natural fibers reinforced composites - II
Lecture 56 - NFRCs and Polymer Applications
Lecture 57 - Polymer Applications in Building Materials
Lecture 58 - Polymer applications in different fields: Polymer in textile
Lecture 59 - Polymer applications in different fields: Polymer in cosmetics
Lecture 60 - Polymer applications in different fields: Polymer and food packaging

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 30 - Case Study - Ethane dehyrogenation
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 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 30 - Diffusion Equation Spherical Co-ordinates Seperation 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 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 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 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

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

Subject Co-ordinator - Prof. V. Kumaran

Co-ordinating Institute - IISc - Bangalore

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

Lecture 30 - Unidirectional transport: Balance laws in cylindrical co-ordinates. Unsteady heat conduction fro
Lecture 31 - Unidirectional transport: Balance laws in cylindrical co-ordinates. Unsteady heat conduction fro
Lecture 32 - Unidirectional transport: Balance laws in cylindrical co-ordinates. Unsteady heat conduction fro
Lecture 33 - Unidirectional transport: Balance laws in cylindrical co-ordinates. Similarity solution for heat
Lecture 34 - Unidirectional transport: Effect of body force in momentum transfer. Falling film
Lecture 35 - Unidirectional transport: Effect of pressure in momentum transfer. Flow in a pipe
Lecture 36 - Unidirectional transport: Friction factor for flow in a pipe
Lecture 37 - Unidirectional transport: Laminar and turbulent flow in a pipe
Lecture 38 - Unidirectional transport: Laminar and turbulent flow in a pipe
Lecture 39 - Unidirectional transport: Oscillatory flow in a pipe. Solution using complex variables
Lecture 40 - Unidirectional transport: Oscillatory flow in a pipe. Solution using complex variables
Lecture 41 - Unidirectional transport: Oscillatory flow in a pipe. Solution using complex variables (Continue
Lecture 42 - Unidirectional transport: Oscillatory flow in a pipe. Low and high Reynolds number solutions
Lecture 43 - Unidirectional transport: Spherical co-ordiantes. Heat conduction from a sphere
Lecture 44 - Mass and energy balance equations in Cartesian co-ordinates
Lecture 45 - Mass and energy balance equations in Cartesian co-ordinates
Lecture 46 - Mass and energy balance equations in spherical co-ordinates
Lecture 47 - Mass and energy balance equations in spherical co-ordinates
Lecture 48 - Momentum balance: Incompressible Navier-Stokes equations
Lecture 49 - Balance equation: Convection and diffusion dominated regimes
Lecture 50 - Diffusion equation: Heat conduction in a rectangular solid
Lecture 51 - Diffusion equation: Heat conduction in a rectangular solid (Continued...)
Lecture 52 - Diffusion equation: Heat conduction around a sphereical inclusion
Lecture 53 - Diffusion equation: Heat conduction around a spherial inclusion
Lecture 54 - Diffusion equation: Effective conductivity of a composite
Lecture 55 - Diffusion equation: Spherical harmonic solutions
Lecture 56 - Diffusion equation: Conduction from a point source
Lecture 57 - Diffusion equation: Method of Greens functions
Lecture 58 - Diffusion equation: Method of images
Lecture 59 - Diffusion equation: Equivalence of spherical harmonics and multipole expansion
Lecture 60 - High Peclet number forced convection: Boundary layer in flow past a heated plate
Lecture 61 - High Peclet number forced convection: Boundary layer in flow past a heated plate (Continued...)
Lecture 62 - High Peclet number forced convection: Flow past a heated sphere
Lecture 63 - High Peclet number forced convection: Flow past a heated sphere (Continued...)
Lecture 64 - High Peclet number forced convection: Transport to a falling film
Lecture 65 - High Peclet number forced convection: Transport to a spherical bubble
Lecture 66 - High Peclet number forced convection: Solutions for an arbitrary geometry
Lecture 67 - High Peclet number forced convection: Taylor dispersion
Lecture 68 - Natural convection: Boussinesq equations for heat transfer

Lecture 69 - Natural convection: Boundary layer equations
Lecture 70 - Natural convection: Boundary layer equations convection
Lecture 71 - Natural convection: Heat transfer correlations

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

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

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Course Introduction
Lecture 2 - Atomic structure
Lecture 3 - Interaction of EM radiation with matter
Lecture 4 - Atomic and molecular orbitals
Lecture 5 - Interaction of EM radiation with matter - I
Lecture 6 - Interaction of EM radiation with matter - II
Lecture 7 - Interaction of interaction of EM radiation with matter - III
Lecture 8 - Emission and absorption spectra
Lecture 9 - MO theory
Lecture 10 - Structure Â property relationship of organic compounds
Lecture 11 - Woodword Fieser rules, structure Â property relationship
Lecture 12 - Beer-Lamberts law
Lecture 13 - Deviations from Beer-Lamberts law, relative concentration error, instrumentation - I
Lecture 14 - UV-Visible spectrophotometry, instrumentation - II
Lecture 15 - UV-Visible spectrophotometry, instrumentation - III
Lecture 16 - UV-Visible spectrophotometry, instrumentation - IV
Lecture 17 - Quantitative analysis Â I
Lecture 18 - Quantitative analysis Â II
Lecture 19 - Quantitative analysis Â III
Lecture 20 - Quantitative analysis Â IV
Lecture 21 - Fluorescence spectrophotometry Â I
Lecture 22 - Fluorescence spectrophotometry - II
Lecture 23 - Fluorescence spectrophotometry - III
Lecture 24 - Instrumentation
Lecture 25 - Chemical analysis, applications
Lecture 26 - Chemiluminiscence, principles
Lecture 27 - Status of spectrophotometry vis a vis environment
Lecture 28 - Separations methods
Lecture 29 - Method development

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

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

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

Co-ordinating Institute - IISc - Bangalore

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

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

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

Co-ordinating Institute - IISc - Bangalore

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

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

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

Co-ordinating Institute - IISc - Bangalore

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

NPTEL Video Course - Chemical Engineering - NOC:Electrochemical Technology in Pollution Control

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

Co-ordinating Institute - IISc - Bangalore

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

Lecture 30 - Electroplating - 3
Lecture 31 - Electroplating - 4
Lecture 32 - Batteries and fuel cells - 1
Lecture 33 - Batteries and fuel cells - 2
Lecture 34 - Batteries and fuel cells - 3
Lecture 35 - Zero liquid discharge

NPTEL Video Course - Chemical Engineering - NOC:Transport Processes

Subject Co-ordinator - Prof. V Kumaran

Co-ordinating Institute - IISc - Bangalore

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

Lecture 30 - Unidirectional transport. Shell balance
Lecture 31 - Unidirectional transport. Common form of transport equations
Lecture 32 - Steady solutions, constant diffusivity, parallel and series conduction
Lecture 33 - Steady solutions, internal source, viscous heating
Lecture 34 - Steady solutions, flow down inclined plane
Lecture 35 - Steady solutions, internal source, electrokinetic flow
Lecture 36 - Steady solutions, internal source, electrokinetic flow
Lecture 37 - Steady solutions, internal source, diffusion-reaction
Lecture 38 - Binary diffusion
Lecture 39 - Binary diffusion
Lecture 40 - Correlations in balance equations. Transport by diffusion
Lecture 41 - Correlations in balance equations. Transport by diffusion
Lecture 42 - Correlations in balance equations. Forced convection
Lecture 43 - Correlations in balance equations. Forced convection
Lecture 44 - Correlations in balance equations. Natural convection
Lecture 45 - Correlations in balance equations. Packed column
Lecture 46 - Cylindrical co-ordinates. Balance equation
Lecture 47 - Cylindrical co-ordinates. Steady conduction
Lecture 48 - Cylindrical co-ordinates. Heat transfer resistance
Lecture 49 - Cylindrical co-ordinates. Examples
Lecture 50 - Spherical co-ordinates. Balance equation
Lecture 51 - Spherical co-ordinates. Heat transfer resistance
Lecture 52 - Laminar flow in a pipe. Momentum balance
Lecture 53 - Laminar flow in a pipe. Velocity profile. Friction factor
Lecture 54 - Laminar flow in a pipe. Friction factor correlation
Lecture 55 - Laminar flow in a pipe. Examples
Lecture 56 - Laminar flow in a pipe. Examples
Lecture 57 - Turbulence. Instability and transition
Lecture 58 - Turbulent flow in a pipe. Dissipation rate, turbulence scales
Lecture 59 - Turbulent flow in a pipe. Turbulence cascade
Lecture 60 - Turbulent flow in a pipe. Structure of turbulence