

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

NPTEL Video Course - Biotechnology - NOC:Transport Phenomena in Biological Systems

Subject Co-ordinator - Prof. G.K. Suraishkumar

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction  
Lecture 2 - Mass Conservation  
Lecture 3 - Mass Conservation for a Macroscopic System  
Lecture 4 - Mass Conservation for a Microscopic System  
Lecture 5 - Useful Derivatives  
Lecture 6 - Equation of Continuity  
Lecture 7 - Mass Flux  
Lecture 8 - Mass and Molar Fluxes  
Lecture 9 - Shell Balance Approach  
Lecture 10 - Continuity Equation Approach  
Lecture 11 - Steady-state Diffusion  
Lecture 12 - Steady-state Diffusion across Tubular Walls  
Lecture 13 - Steady-state Radial Diffusion  
Lecture 14 - Steady-state Diffusion with Reaction  
Lecture 15 - Unsteady-state Diffusion  
Lecture 16 - Unsteady-state Diffusion (Continued...)  
Lecture 17 - Pseudo Steady State Approximation (Continued...)  
Lecture 18 - Pseudo Steady State Approximation (Continued...)  
Lecture 19 - Review of Mass Flux  
Lecture 20 - Momentum Flux - Introduction  
Lecture 21 - Rheology  
Lecture 22 - Fluid Flow types  
Lecture 23 - Shell Momentum Balances  
Lecture 24 - Shell Momentum Balances (Continued...)  
Lecture 25 - Equation of Motion  
Lecture 26 - Equation of Motion (Continued...)  
Lecture 27 - Application of Equation of Motion to Flow Over an Inclined Plane  
Lecture 28 - Laminar Flow through a Pipe  
Lecture 29 - Laminar Flow through a Pipe (Continued...)

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Lecture 30 - Capillary Flow  
Lecture 31 - Couette Flow  
Lecture 32 - Non-dimensional Analysis  
Lecture 33 - Unsteady State Flow  
Lecture 34 - Unsteady State Flow (Continued...)  
Lecture 35 - Pulsatile Flow  
Lecture 36 - Turbulent Flow  
Lecture 37 - Macroscopic Aspects  
Lecture 38 - Friction Factor for Flow through a Straight Horizontal Pipe  
Lecture 39 - Application of the Engineering Bernoulli Equation to a Piping Network  
Lecture 40 - Stenosis in an Artery  
Lecture 41 - Friction Factor for Relative Motion between a Solid and a Liquid  
Lecture 42 - Friction Factor for Packed Beds  
Lecture 43 - Review of Momentum Flux  
Lecture 44 - Review of Momentum Flux (Continued...)  
Lecture 45 - Thermal Energy Flux  
Lecture 46 - Equation of Energy  
Lecture 47 - Temperature Profile in a Tissue  
Lecture 48 - Unsteady-state Heat Conduction  
Lecture 49 - Review of Heat Flux  
Lecture 50 - Charge Flux  
Lecture 51 - Charge Flux - Some Fundamentals  
Lecture 52 - Charge Flux - Some More Fundamentals  
Lecture 53 - Getting Useful Relationships through Maxwell's Equations  
Lecture 54 - Charges/Ions in Solution  
Lecture 55 - Charge Flux  
Lecture 56 - Fluxes Under Simultaneous, Multiple Driving Forces  
Lecture 57 - Simultaneous Concentration Gradient and Electrical Potential Gradient  
Lecture 58 - Mobility of Ions Across a Membrane  
Lecture 59 - Electrical Circuit Representation of a Membrane  
Lecture 60 - Action Potential and Axial Current  
Lecture 61 - Electrophoresis  
Lecture 62 - Simultaneous Concentration Gradient and Velocity Gradient  
Lecture 63 - Simultaneous Concentration Gradient and Velocity Gradient - Bioreactor Kla  
Lecture 64 - Gas-Liquid Interphase Transport  
Lecture 65 - Gas-Liquid Interphase Transport (Continued...)  
Lecture 66 - Bioreactor Kla Estimation  
Lecture 67 - Liquid Phase Oxygen-Supply Strategy  
Lecture 68 - LPOS and Its Mechanism

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- Lecture 69 - LPOS for Mold Cultivations
- Lecture 70 - LPOS Optimization and Costs
- Lecture 71 - Couette Flow Cultivations
- Lecture 72 - Pseudo-Steady State Approximation Applied to Bio-oil Production
- Lecture 73 - Pseudo-Steady State Approximation Applied to Cancer Treatment
- Lecture 74 - Kinetics of a Process with an Enzyme Immobilized on a Non-porous Slab
- Lecture 75 - Simultaneous Temperature Gradient and Velocity Gradient
- Lecture 76 - Design of Heat Exchangers
- Lecture 77 - Design of Heat Exchangers (Continued...)
- Lecture 78 - Course Review - Part 1
- Lecture 79 - Course Review - Part 2
- Lecture 80 - Course Review - Part 3
- Lecture 81 - Course Review - Part 4