

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

NPTEL Video Course - Biotechnology - Biomathematics

Subject Co-ordinator - Dr. Ranjith Padinhateeri

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction
- Lecture 2 - Graphs and functions - I
- Lecture 3 - Graphs and functions - II
- Lecture 4 - Functions and derivatives
- Lecture 5 - Calculation of derivatives
- Lecture 6 - Differentiation and its application in Biology - I
- Lecture 7 - Differentiation and its application in Biology - II
- Lecture 8 - Differentiation and its application in Biology - III
- Lecture 9 - Differentiation and its application in Biology - IV
- Lecture 10 - Integration - I
- Lecture 11 - Integration - II
- Lecture 12 - Differential equations - I
- Lecture 13 - Differential equations - II
- Lecture 14 - Vectors - I
- Lecture 15 - Vectors - II
- Lecture 16 - Vectors - III
- Lecture 17 - Nernst equation
- Lecture 18 - Diffusion - I
- Lecture 19 - Diffusion - II
- Lecture 20 - Diffusion - III
- Lecture 21 - Statistics
- Lecture 22 - Statistics
- Lecture 23 - Understanding Normal distribution
- Lecture 24 - Fitting a function to experimental data
- Lecture 25 - Size of a flexible protein
- Lecture 26 - Uniform and Poisson distributions; Knudson's analysis
- Lecture 27 - Fourier Series - I
- Lecture 28 - Fourier Series - II
- Lecture 29 - Fourier transform

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- Lecture 30 - Master equation
- Lecture 31 - Evolution
- Lecture 32 - Tutorial - I
- Lecture 33 - Tutorial - II
- Lecture 34 - Temperature, Energy and Entropy
- Lecture 35 - Partition function, Free energy
- Lecture 36 - Bending fluctuations of DNA and spring-like proteins
- Lecture 37 - Force-extension and looping of DNA
- Lecture 38 - Thermodynamics of protein organization along DNA
- Lecture 39 - Learning mathematics with the help of a computer

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

NPTEL Video Course - Biotechnology - Proteomics and Genomics

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

Lecture 1
Lecture 2
Lecture 3
Lecture 4
Lecture 5
Lecture 6
Lecture 7
Lecture 8
Lecture 9
Lecture 10
Lecture 11
Lecture 12
Lecture 13
Lecture 14
Lecture 15
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Lecture 30
Lecture 31
Lecture 32
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Lecture 39
Lecture 40

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

NPTEL Video Course - Biotechnology - NOC:Proteins and Gel-Based Proteomics

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

Lecture 0 - Proteins and Gel-Based Proteomics; Course Introduction

Lecture 1 - Introduction to amino acids

Lecture 2 - Introduction to proteins

Lecture 3 - Protein folding & misfolding

Lecture 4 - Protein purification techniques

Lecture 5 - Introduction to proteomics

Lecture 6 - Systems biology and proteomics

Lecture 7 - Sample preparation and pre-analytical factors

Lecture 8 - Sample preparation

Lecture 9 - Sample preparation

Lecture 10 - One-dimensional electrophoresis

Lecture 11 - 2-DE

Lecture 12 - 2-DE

Lecture 13 - 2-DE

Lecture 14 - 2-DE

Lecture 15 - 2-DE

Lecture 16 - 2D-DIGE

Lecture 17 - 2D-DIGE

Lecture 18 - 2D-DIGE

Lecture 19 - Protein identification using MALDI-TOF/TOF

Lecture 20 - Proteomics experiment data analysis & challenges

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

NPTEL Video Course - Biotechnology - NOC:Mass spectrometry based proteomics

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

- Lecture 0 - Introductory lecture
- Lecture 1 - Introduction to proteomics
- Lecture 2 - Proteomics and sample preparation
- Lecture 3 - Bacterial protein extraction
- Lecture 4 - In-gel digestion
- Lecture 5 - Fundamentals of mass spectrometry
- Lecture 6 - Chromatography technologies
- Lecture 7 - Liquid chromatography
- Lecture 8 - Mass spectrometry
- Lecture 9 - Mass spectrometry
- Lecture 10 - MALDI sample preparation and analysis
- Lecture 11 - Introduction to quantitative proteomics
- Lecture 12 - Hybrid mass spectrometry configurations
- Lecture 13 - SILAC
- Lecture 14 - iTRAQ
- Lecture 15 - TMT
- Lecture 16 - Quantitative proteomics data analysis
- Lecture 17 - Proteomics and Systems biology I
- Lecture 18 - Proteomics & Systems biology II
- Lecture 19 - Proteomics applications
- Lecture 20 - Advances and challenges in proteomics

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

NPTEL Video Course - Biotechnology - NOC:Interactomics: Protein Arrays and Label-free Biosensors

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction to Interactomics
- Lecture 2 - An overview of label-free technologies
- Lecture 3 - An overview of surface plasmon resonance (SPR)
- Lecture 4 - An overview of surface plasmon resonance imaging (SPRi)
- Lecture 5 - Basics of SPR
- Lecture 6 - Basics of SPR
- Lecture 7 - Protein immobilization for protein-protein interaction studies
- Lecture 8 - Protein-protein interaction study
- Lecture 9 - Protein-protein interaction study
- Lecture 10 - Protein-small molecule interaction study
- Lecture 11 - Protein-small molecule interaction study
- Lecture 12 - SPR
- Lecture 13 - SPR
- Lecture 14 - An overview of ellipsometry and interferometry techniques
- Lecture 15 - An introduction to BioLayer Interferometry (BLI) and its applications in protein research
- Lecture 16 - Kinetic analysis of protein-protein interaction using BLI
- Lecture 17 - Label-free quantification of proteins using BLI
- Lecture 18 - Diffraction-based biosensors - I
- Lecture 19 - Diffraction-based biosensors - II
- Lecture 20 - Nanotechniques in proteomics - I
- Lecture 21 - Nanotechniques in proteomics - II
- Lecture 22 - High throughput platforms of interactomics
- Lecture 23 - Conventional label based detection techniques for Protein microarrays
- Lecture 24 - Novel detection techniques for Protein microarrays
- Lecture 25 - Recombinational cloning and its application for Protein microarrays
- Lecture 26 - An introduction to Cell-free protein synthesis
- Lecture 27 - Cell-free synthesis based protein microarrays
- Lecture 28 - Cell-free synthesis based protein microarrays
- Lecture 29 - Digging deeper into NAPPA

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- Lecture 30 - Digging deeper into NAPPA
- Lecture 31 - Application of cell free expression protein microarrays in biomarker discovery
- Lecture 32 - Application of cell free expression protein microarrays in immunological studies
- Lecture 33 - Basics of microarray image scanning
- Lecture 34 - Software for Image scanning and data processing
- Lecture 35 - Microarray Data Analysis - Part I
- Lecture 36 - Microarray Data Analysis - Part II
- Lecture 37 - Application of protein microarray in biomarker discovery - I
- Lecture 38 - Application of protein microarray in biomarker discovery - II
- Lecture 39 - Systems biology and networks
- Lecture 40 - Challenges in proteomics

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

NPTEL Video Course - Biotechnology - NOC:Introduction to Proteomics

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction to amino acids

Lecture 2 - Introduction to proteins

Lecture 3 - Protein folding and misfolding

Lecture 4 - Introduction to proteomics

Lecture 5 - Lab session â Protein-protein interaction using label-free biosensors

Lecture 6 - Sample preparation and pre-analytical factors

Lecture 7 - Sample preparation

Lecture 8 - Sample preparation

Lecture 9 - One-dimensional electrophoresis

Lecture 10 - Introduction to 2-DE

Lecture 11 - 2-DE

Lecture 12 - 2-DE

Lecture 13 - 2-DE Applications

Lecture 14 - 2-DE Applications (Continued...) and Challenges

Lecture 15 - Lab session - Protein/peptide pre-fractionation using OFFGEL FRACTIONATOR and data analysis

Lecture 16 - 2D-DIGE

Lecture 17 - 2D-DIGE

Lecture 18 - 2D-DIGE

Lecture 19 - Systems biology and proteomics - I

Lecture 20 - Systems biology and proteomics - II

Lecture 21 - Fundamentals of mass spectrometry

Lecture 22 - Chromatography technologies

Lecture 23 - Liquid chromatography

Lecture 24 - Mass spectrometry

Lecture 25 - Mass spectrometry

Lecture 26 - MALDI sample preparation and analysis

Lecture 27 - Hybrid mass spectrometry configurations

Lecture 28 - Lab session - Demonstration of Q-TOF MS technology

Lecture 29 - In-gel and in-solution digestion

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- Lecture 30 - Lab session - Sample preparation
- Lecture 31 - Introduction to quantitative proteomics
- Lecture 32 - SILAC
- Lecture 33 - iTRAQ
- Lecture 34 - TMT
- Lecture 35 - Quantitative proteomics data analysis
- Lecture 36 - Proteomics applications
- Lecture 37 - Challenges in proteomics
- Lecture 38 - OMICS and translational research
- Lecture 39 - Lab session â Targeted proteomics using triple quadrupole mass spectrometry
- Lecture 40 - Lab session â Targeted proteomics

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

NPTEL Video Course - Biotechnology - NOC:Introduction to Biostatistics

Subject Co-ordinator - Prof. Shamik Sen

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction to the course
- Lecture 2 - Data representation and plotting
- Lecture 3 - Arithmetic mean
- Lecture 4 - Geometric mean
- Lecture 5 - Measure of Variability, Standard deviation
- Lecture 6 - SME, Z-Score, Box plot
- Lecture 7 - Moments, Skewness
- Lecture 8 - Kurtosis, R programming
- Lecture 9 - R programming
- Lecture 10 - Correlation
- Lecture 11 - Correlation and Regression - Part-I
- Lecture 12 - Correlation and Regression - Part-II
- Lecture 13 - Interpolation and extrapolation
- Lecture 14 - Nonlinear data fitting
- Lecture 15 - Concept of Probability
- Lecture 16 - Counting principle, Permutations, and Combinations
- Lecture 17 - Conditional probability
- Lecture 18 - Conditional probability and Random variables
- Lecture 19 - Random variables, Probability mass function, and Probability density function
- Lecture 20 - Expectation, Variance and Covariance - Part-I
- Lecture 21 - Expectation, Variance and Covariance - Part-II
- Lecture 22 - Binomial random variables and Moment generating function
- Lecture 23 - Probability distribution
- Lecture 24 - Uniform distribution Part-II and Normal distribution Part-I
- Lecture 25 - Normal distribution Part-II and Exponential distribution
- Lecture 26 - Sampling distributions and Central limit theorem - Part-I
- Lecture 27 - Sampling distributions and Central limit theorem - Part-II
- Lecture 28 - Central limit theorem - Part-III and Sampling distributions of sample mean
- Lecture 29 - Central limit theorem - Part-IV and Confidence intervals

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- Lecture 30 - Confidence intervals Part- II
- Lecture 31 - Test of Hypothesis - 1
- Lecture 32 - Test of Hypothesis - 2 (1 tailed and 2 tailed Test of Hypothesis, p-value)
- Lecture 33 - Test of Hypothesis - 3 (1 tailed and 2 tailed Test of Hypothesis, p-value)
- Lecture 34 - Test of Hypothesis - 4 (Type -1 and Type -2 error)
- Lecture 35 - T-test
- Lecture 36 - 1 tailed and 2 tailed T-distribution, Chi-square test
- Lecture 37 - ANOVA - 1
- Lecture 38 - ANOVA - 2
- Lecture 39 - ANOVA - 3
- Lecture 40 - ANOVA for linear regression, Block Design

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

NPTEL Video Course - Biotechnology - NOC:Introduction to Mechanobiology

Subject Co-ordinator - Prof. Shamik Sen

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Need to Study Mechanobiology
- Lecture 2 - Cell as a Tent, Individual Components
- Lecture 3 - Cell-ECM Crosstalk
- Lecture 4 - ECM Proteins
- Lecture 5 - Measuring Properties of Collagen Networks
- Lecture 6 - Properties of Collagen Networks
- Lecture 7 - Rheology
- Lecture 8 - Rheology of Biopolymer Networks
- Lecture 9 - Atomic Force Microscopy (AFM)
- Lecture 10 - Design of Protein Constructs for AFM
- Lecture 11 - Protein Unfolding using AFM
- Lecture 12 - Protein Unfolding using AFM
- Lecture 13 - Focal Adhesions
- Lecture 14 - Focal Adhesion Organization
- Lecture 15 - Focal Adhesions
- Lecture 16 - Cytoskeleton
- Lecture 17 - Force-velocity Relationships of Actin Networks
- Lecture 18 - Mesenchymal Cell Migration
- Lecture 19 - Actin Dynamics during Mesenchymal Migration
- Lecture 20 - Actin Dynamics during Mesenchymal Migration
- Lecture 21 - Adhesion Independent Migration
- Lecture 22 - Adhesion Independent and Collective Cell Migration
- Lecture 23 - Collective Cell Migration
- Lecture 24 - Mechanobiology of Stem Cell Fate - I
- Lecture 25 - Mechanobiology of Stem Cell Fate - II
- Lecture 26 - Mechanobiology of Stem Cell Fate - III
- Lecture 27 - Mechanobiology of Diseases
- Lecture 28 - Mechanobiology of Diseases
- Lecture 29 - Mechanobiology of Diseases

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- Lecture 30 - Mechanobiology of Diseases
- Lecture 31 - Mechanobiology of Diseases
- Lecture 32 - Nuclear Mechanotransduction
- Lecture 33 - Nuclear Mechanotransduction
- Lecture 34 - Nuclear Mechanotransduction
- Lecture 35 - Mechanical Forces and DNA damage
- Lecture 36 - Techniques in Mechanobiology
- Lecture 37 - Techniques in Mechanobiology
- Lecture 38 - Techniques in Mechanobiology
- Lecture 39 - Techniques in Mechanobiology
- Lecture 40 - Techniques in Mechanobiology

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NPTEL Video Course - Biotechnology - NOC: Introductory Mathematical Methods for Biologists

Subject Co-ordinator - Dr. Ranjith Padinhateeri

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction
Lecture 2 - Graphs and Functions
Lecture 3 - Equations as Graphs
Lecture 4 - Graphs
Lecture 5 - Graphs
Lecture 6 - Images as 2D/3D Functions
Lecture 7 - Functions and its Derivatives
Lecture 8 - Computing Derivatives of Curves
Lecture 9 - Rules for Calculating Derivatives
Lecture 10 - Understanding Derivatives
Lecture 11 - Curvature and Second Derivative
Lecture 12 - Plotting Curves
Lecture 13 - Numerical Calculation of Derivatives
Lecture 14 - Function, Derivatives and Series Expansion
Lecture 15 - L'Hopital's Rule and Partial Derivatives
Lecture 16 - Integration
Lecture 17 - Integration
Lecture 18 - Integration
Lecture 19 - Integration
Lecture 20 - Integration
Lecture 21 - Exponential Growth and Decay
Lecture 22 - Scalars and Vectors
Lecture 23 - Vectors
Lecture 24 - Cell Symmetry
Lecture 25 - Gradient, Forces and Flows
Lecture 26 - Gradient, Forces and Flows
Lecture 27 - Understanding Diffusion
Lecture 28 - Diffusion Constant and Einstein Relation 1905
Lecture 29 - Diffusion Equation

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- Lecture 30 - Diffusion vs. Active Transport
- Lecture 31 - Nernst Equation
- Lecture 32 - Fourier Series
- Lecture 33 - Fourier Series
- Lecture 34 - Fourier Transform
- Lecture 35 - Introduction to Statistics
- Lecture 36 - Mean, Standard deviation and Distribution
- Lecture 37 - Frequency Distribution and Probability Distribution
- Lecture 38 - Binomial Distribution
- Lecture 39 - Normal Distribution
- Lecture 40 - Hypothesis Testing and Mathematical Modeling

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

NPTEL Video Course - Biotechnology - NOC:Bioengineering: An Interface with Biology and Medicine

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Why biology for engineers - Part I
- Lecture 2 - Why biology for engineers - Part II
- Lecture 3 - Life processes and Cell
- Lecture 4 - Cell and its properties
- Lecture 5 - Clinician's Perspective - I
- Lecture 6 - Nucleic Acid and Central Dogma
- Lecture 7 - DNA Tools
- Lecture 8 - DNA Tools
- Lecture 9 - DNA Tools and Biotechnology - I
- Lecture 10 - DNA Tools and Biotechnology - II
- Lecture 11 - DNA Tools and Biotechnology - III
- Lecture 12 - DNA Tools and Biotechnology - IV
- Lecture 13 - DNA Tools and Biotechnology - V
- Lecture 14 - DNA Tools and Biotechnology - VI
- Lecture 15 - Clinician's Perspective - II
- Lecture 16 - Genetics - I
- Lecture 17 - Genetics - II
- Lecture 18 - Genetics - III
- Lecture 19 - Genetics - IV
- Lecture 20 - Clinician's Perspective - III
- Lecture 21 - Chromosomal basis of inheritance
- Lecture 22 - Linkage, chromosomal disorders
- Lecture 23 - Classical Genetics Experiments
- Lecture 24 - Bacteria and Viruses
- Lecture 25 - Clinician's Perspective - IV
- Lecture 26 - Cell cycle disregulation and Cancer
- Lecture 27 - Developmental Biology
- Lecture 28 - Principles and application of Animal Cloning
- Lecture 29 - Evolution

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- Lecture 30 - Clinician's Perspective - V
- Lecture 31 - Amino acids and proteins
- Lecture 32 - Proteins and Proteomics
- Lecture 33 - Techniques to Study Protein and Proteome - I
- Lecture 34 - Techniques to Study Protein and Proteome - II
- Lecture 35 - Bioinformatics - I
- Lecture 36 - Techniques to Study Protein and Proteome - III
- Lecture 37 - Protein Interactions and Microarrays
- Lecture 38 - Protein interactions and Systems biology
- Lecture 39 - Bioinformatics - II
- Lecture 40 - Ethics in Research and Publications

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NPTEL Video Course - Biotechnology - NOC:Applications of Interactomics using Genomics and Proteomics Technology

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction to Interactomics and Protein Arrays

Lecture 2 - NAPPA Technology and Protein Arrays - I

Lecture 3 - NAPPA Technology and Protein Arrays - II

Lecture 4 - Biomarkers

Lecture 5 - Biomarkers

Lecture 6 - Biomarkers

Lecture 7 - NAPPA and its applications in study of antibody immune response in disease and in drug Screening

Lecture 8 - NAPPA and its applications in study of antibody immune response in disease and in drug screening

Lecture 9 - NAPPA and its applications in study of antibody immune response in disease and in drug screening

Lecture 10 - Using functional proteomics to identify biomarkers and therapeutic targets - I

Lecture 11 - Using functional proteomics to identify biomarkers and therapeutic targets - II

Lecture 12 - Applications of protein microarrays in Malaria Research - I

Lecture 13 - Applications of protein microarrays in Malaria Research - II

Lecture 14 - Applications of protein microarrays in Cancer Research - I

Lecture 15 - Applications of protein microarrays in Cancer Research - II

Lecture 16 - Introduction to Bioprinting and Iris's Optical QC Benefits - I

Lecture 17 - Introduction to Bioprinting and Iris's Optical QC Benefits - II

Lecture 18 - Basics and Applications of Reverse Phase Protein Arrays - I

Lecture 19 - Basics and Applications of Reverse Phase Protein Arrays - II

Lecture 20 - Basics and Applications of Reverse Phase Protein Arrays - III

Lecture 21 - Antibody signatures defined by high-content peptide microarray analysis

Lecture 22 - An overview of label-free technologies - I

Lecture 23 - An overview of label-free technologies - II

Lecture 24 - Mass Spectrometry coupled Interactomics - I

Lecture 25 - Mass Spectrometry coupled Interactomics - II

Lecture 26 - Biomolecular interactions using Bio-Layer Interferometry (BLI) - I

Lecture 27 - Biomolecular interactions using Bio-Layer Interferometry (BLI) - II

Lecture 28 - Biomolecular interaction analytics using MicroScale Thermophoresis

Lecture 29 - Surface Plasmon Resonance- Principles and Assays - I

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- Lecture 30 - Surface Plasmon Resonance- Principles and Assays - II
- Lecture 31 - Use of SPR in unravelling domain motif interactions of proteasomal assembly chaperones
- Lecture 32 - Next-Generation Sequencing Technology- Ion Torrent
- Lecture 33 - NGS Technology- Bioinformatics and data analysis - I
- Lecture 34 - NGS Technology- Bioinformatics and data analysis - II
- Lecture 35 - Next-Generation Sequencing Technology-MiSeq System
- Lecture 36 - NGS target enrichment workflow for exomes, targeted panels and beyond
- Lecture 37 - The Human Pathology Atlas
- Lecture 38 - The Human Pathology Atlas
- Lecture 39 - Conclusions and Overview - I (Statistical analysis - I)
- Lecture 40 - Conclusions and overview - II (Statistical analysis - II)

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NPTEL Video Course - Biotechnology - NOC:Introduction to Proteogenomics

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Proteogenomics overview - I
Lecture 2 - Proteogenomics overview - II
Lecture 3 - Introduction to Genomics - Part I
Lecture 4 - Introduction to Genomics - Part II
Lecture 5 - Introduction to Genomics - Part III
Lecture 6 - Perspectives in Proteogenomics - I
Lecture 7 - Advancement in Cancer Genomics
Lecture 8 - Introduction to Genomics - Part IV
Lecture 9 - Introduction to Genomics - cBioPortal
Lecture 10 - Genotype, Gene expression and Phenotype - I
Lecture 11 - Genotype, Gene expression and Phenotype - II
Lecture 12 - An overview of NGS technology
Lecture 13 - NGS - Sequencing by synthesis - I
Lecture 14 - NGS - Sequencing by synthesis - II
Lecture 15 - Introduction to Proteomics
Lecture 16 - Proteomics
Lecture 17 - Applications of Proteomics
Lecture 18 - Introduction to MS-based Proteomics - I
Lecture 19 - Introduction to MS-based Proteomics - II
Lecture 20 - Applications of NGS - IonTorrent
Lecture 21 - Genomic Analysis using Droplet PCR - I
Lecture 22 - Introduction to MS-based Proteomics - I (Hands-on session)
Lecture 23 - Introduction to MS-based Proteomics - II (Hands-on session)
Lecture 24 - Data analysis
Lecture 25 - Data analysis
Lecture 26 - Data analysis
Lecture 27 - Genomic Analysis using Droplet PCR - II
Lecture 28 - Topics in Proteogenomics
Lecture 29 - Machine learning and Clustering

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- Lecture 30 - Hypothesis testing
- Lecture 31 - ProTIGY - I
- Lecture 32 - ProTIGY - II
- Lecture 33 - Proteomics Data Analysis
- Lecture 34 - Proteomics Lab Demonstration - I
- Lecture 35 - Proteomics Lab Demonstration - II
- Lecture 36 - Workflow to Automated Data Processing
- Lecture 37 - Introduction to Fire Cloud
- Lecture 38 - FireCloud and Data Model
- Lecture 39 - Bioinformatics solutions for Big Data Analysis - I
- Lecture 40 - Bioinformatics solutions for Big Data Analysis - II
- Lecture 41 - Introduction to Targeted Proteomics
- Lecture 42 - Data analysis using Skyline
- Lecture 43 - Large-scale data Science - I
- Lecture 44 - Large-scale data Science - II
- Lecture 45 - Large-scale data Science - III
- Lecture 46 - DIA-SWATH Atlas - I
- Lecture 47 - DIA-SWATH Atlas - II
- Lecture 48 - Prediction Analysis
- Lecture 49 - Pathway Enrichment and Network Analysis
- Lecture 50 - Human Protein Atlas - I
- Lecture 51 - Human Protein Atlas - II
- Lecture 52 - Affinity based proteomics & HPA
- Lecture 53 - Clinical Considerations for OMICS - I
- Lecture 54 - Clinical Considerations for OMICS - II
- Lecture 55 - Topics in Proteogenomics
- Lecture 56 - Integrative Genomics Viewer (IGV)
- Lecture 57 - Introduction to Proteogenomics - I
- Lecture 58 - Introduction to Proteogenomics - II
- Lecture 59 - Sequence centric proteogenomics
- Lecture 60 - Variant Analysis
- Lecture 61 - Proteomics - Clinical Applications
- Lecture 62 - Perspectives in Proteogenomics - II
- Lecture 63 - Predictive Analysis - I
- Lecture 64 - Predictive Analysis - II
- Lecture 65 - Association/ Marker Selection
- Lecture 66 - WebGestalt - I
- Lecture 67 - WebGestalt - II
- Lecture 68 - Perspectives in Proteogenomics - III

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- Lecture 69 - Network Analysis - I
- Lecture 70 - Network Analysis - II
- Lecture 71 - Mutations and Signaling - I
- Lecture 72 - Mutations and Signaling - II
- Lecture 73 - Pathway Enrichment - I
- Lecture 74 - Perspectives in Proteogenomics - IV
- Lecture 75 - Pathway Enrichment - II
- Lecture 76 - Sequence - GSEA
- Lecture 77 - Linked Omics - I
- Lecture 78 - Linked Omics - II
- Lecture 79 - Proteogenomics - Opportunities and Challenges
- Lecture 80 - Perspectives in Proteogenomics - V

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

NPTEL Video Course - Biotechnology - NOC:Interactomics: Basics and Applications

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction to Proteomics
- Lecture 2 - Introduction to Interactomics
- Lecture 3 - High throughput platforms of interactomics
- Lecture 4 - Cell-free expression based protein microarrays
- Lecture 5 - NAPPA
- Lecture 6 - NAPPA Technology and Protein Arrays - I
- Lecture 7 - NAPPA Technology and Protein Arrays - II
- Lecture 8 - Biomarkers
- Lecture 9 - Biomarkers
- Lecture 10 - Biomarkers
- Lecture 11 - NAPPA and its applications in study of antibody immune response in disease and in drug screening
- Lecture 12 - NAPPA and its applications in study of antibody immune response in disease and in drug screening
- Lecture 13 - NAPPA and its applications in study of antibody immune response in disease and in drug screening
- Lecture 14 - Using functional proteomics to identify biomarkers and therapeutic targets - I
- Lecture 15 - Using functional proteomics to identify biomarkers and therapeutic targets - II
- Lecture 16 - Applications of protein microarrays in Malaria Research - I
- Lecture 17 - Applications of protein microarrays in Malaria Research - II
- Lecture 18 - Introduction to Bioprinting and IrisOptical QC Benefits - I
- Lecture 19 - Introduction to Bioprinting and IrisOptical QC Benefits - II
- Lecture 20 - Screening of autoantibody signatures in cancer patients
- Lecture 21 - Basics of Image Scanning and data acquisition
- Lecture 22 - Applications of protein arrays in identification of autoantibody signatures - I
- Lecture 23 - Applications of protein arrays in identification of autoantibody signatures - II
- Lecture 24 - Applications of protein microarrays in deciphering PTMs and biological networks
- Lecture 25 - Basics and Applications of Reverse Phase Protein Arrays - I
- Lecture 26 - Basics and Applications of Reverse Phase Protein Arrays - II
- Lecture 27 - Basics and Applications of Reverse Phase Protein Arrays - III
- Lecture 28 - An overview of label-free technologies
- Lecture 29 - Surface Plasmon Resonance - Principles and Assays - I

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

- Lecture 30 - Surface Plasmon Resonance - Principles and Assays - II
- Lecture 31 - Basics of SPR
- Lecture 32 - Basics of SPR
- Lecture 33 - Protein immobilization for protein-protein interaction studies
- Lecture 34 - Protein-protein interaction study
- Lecture 35 - Protein-protein interaction study
- Lecture 36 - Use of SPR in unravelling domain motif interactions of proteasomal assembly chaperones
- Lecture 37 - Protein-small molecule interaction study
- Lecture 38 - Protein-small molecule interaction study
- Lecture 39 - An introduction to biolayer interferometry (BLI) and its applications in protein research
- Lecture 40 - Biomolecular interactions using Bio-Layer Interferometry (BLI) - I
- Lecture 41 - Biomolecular interactions using Bio-Layer Interferometry (BLI) - II
- Lecture 42 - Lab session- An introduction to BioLayer Interferometry (BLI) and its applications in protein re
- Lecture 43 - Applications of label-free technologies - II
- Lecture 44 - Biomolecular interaction analytics using MicroScale Thermophoresis
- Lecture 45 - Mass Spectrometry coupled Interactomics - I
- Lecture 46 - Mass Spectrometry coupled Interactomics - II
- Lecture 47 - Next-Generation Sequencing Technology - Ion Torrent
- Lecture 48 - NGS Technology - Bioinformatics and data analysis - I
- Lecture 49 - NGS Technology - Bioinformatics and data analysis - II
- Lecture 50 - Next-Generation Sequencing Technology- Illumina
- Lecture 51 - Agilent complete NGS target enrichment workflow for exomes, targeted panels and beyond
- Lecture 52 - The Human Pathology Atlas
- Lecture 53 - The Human Pathology Atlas
- Lecture 54 - Statistical Analysis - I
- Lecture 55 - Statistical Analysis - II
- Lecture 56 - Secondary Data Analysis
- Lecture 57 - Pathway Enrichment and Network Analysis
- Lecture 58 - Data Repositories and Databases
- Lecture 59 - Application of multi-omics approach for better understanding of cancers
- Lecture 60 - Integrated Omics and Systems Biology- Conclusion

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

NPTEL Video Course - Biotechnology - NOC:Maternal Infant Young Child Nutrition

Subject Co-ordinator - Prof. Rupal Dalal

Co-ordinating Institute - IIT Bombay

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

- Lecture 1 - NFHS 5 data
- Lecture 2 - Evidences from the field
- Lecture 3 - MIYCF framework
- Lecture 4 - Capacity building
- Lecture 5 - The story of urban and rural NGO and the story of Kailash
- Lecture 6 - CNNS Nutrition data of children between 5-9 years of age
- Lecture 7 - New Learnings - HST Pedagogy
- Lecture 8 - Nutrients essential in children - Type 1 and Type 2 nutrients
- Lecture 9 - Hidden hunger and types of malnutrition
- Lecture 10 - Importance of Protein
- Lecture 11 - Importance of Fat
- Lecture 12 - Importance of Folate
- Lecture 13 - Importance of Vitamin B12
- Lecture 14 - Importance of Selenium
- Lecture 15 - Importance of Calcium and Calcium rich recipes
- Lecture 16 - Importance of Magnesium and Magnesium rich recipes
- Lecture 17 - Importance of Potassium and Potassium rich recipes
- Lecture 18 - Junk food and reasons for consumption of junk food
- Lecture 19 - Importance of Insulin
- Lecture 20 - Introduction to macronutrients
- Lecture 21 - First 1,000 days LIVE session-Importance of first 1000 days spoken tutorial
- Lecture 22 - Essential nutrition actions for pregnant women
- Lecture 23 - Importance of Iron-Iron rich veg and non-veg recipes
- Lecture 24 - Importance of Vitamin C and vitamin C rich recipes
- Lecture 25 - Sulphur Live session-Importance of sulphur-Sulphur rich recipes
- Lecture 26 - Science of breastfeeding
- Lecture 27 - Golden hour-Importance of golden hour and Colostrum feeding Spoken Tutorial
- Lecture 28 - Importance of breastfeeding-Comparsion of breatsmilk with other substitutes
- Lecture 29 - Breast crawl during normal delivery and ceasarean delivery

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

- Lecture 30 - Indian law to protect breastfeeding
- Lecture 31 - Spoken tutorials on new born care and how to bathe a baby
- Lecture 32 - Spoken tutorials on KMC and KMC bag making
- Lecture 33 - Mother's Preparation and Baby's Positioning
- Lecture 34 - Holding the Breast and Latching the Baby to the Breast
- Lecture 35 - Other Counselling Points
- Lecture 36 - Health Spoken Tutorial on Cross Cradle Hold and Latching
- Lecture 37 - Solutions to Problems faced while Feeding the Baby in Cross Cradle Hold
- Lecture 38 - Live Videos of Positioning and Latching
- Lecture 39 - Other breastfeeding holds - Football hold. Cradle hold
- Lecture 40 - Sidelying Hold and Laid back Hold
- Lecture 41 - Poor weight gain due to breastfeeding factors and other factors
- Lecture 42 - Breastfeeding During Covid
- Lecture 43 - Manual Expression and storage of Breastmilk and how to feed expressed breastmilk
- Lecture 44 - Nipple conditions, complications of nipple shields. Breast conditions
- Lecture 45 - Guidelines for complementary feeding. General guidelines
- Lecture 46 - Personal Hygiene needed for handling baby food. Safe preparation and storage of baby food
- Lecture 47 - Vegetarian and non-vegetarian recipes for 6-month-old babies. Powder recipes for babies
- Lecture 48 - Vegetarian and non-vegetarian recipes for 7-month-old and 8 to 11-month-old babies
- Lecture 49 - Issues faced during complementary feeding
- Lecture 50 - Veg recipes for 12-18 month old babies-Non-veg recipes for 12-18 month old babies
- Lecture 51 - Veg recipes for 19-24 month old children-Non-veg recipes for 19-24 month old children
- Lecture 52 - Celebration recipes - Delicious recipes for kids parties
- Lecture 53 - Vegetarian and Non vegetarian recipes for Adolescents. Pre pregnancy nutrition
- Lecture 54 - Nutritious vegetarian and non-vegetarian recipes for pregnant women
- Lecture 55 - Nutritious vegetarian and non-vegetarian recipes for lactating women
- Lecture 56 - The WHO Multicentre Growth Reference Study (1997-2003)
- Lecture 57 - Standard Normal Deviation. WHO Z Score Charts
- Lecture 58 - Spoken tutorials on WHO weight-for-age and length-for-age percentile growth charts
- Lecture 59 - Anthropometric Measurements
- Lecture 60 - Cross Cradle Hold and 45 points - IEC chart - Part 1
- Lecture 61 - Cross Cradle Hold and 45 points - IEC chart - Part 2. Breastfeeding assessment form
- Lecture 62 - Nutrition Chart
- Lecture 63 - Learning Action Protocol - Part 1
- Lecture 64 - Learning Action Protocol - Part 2
- Lecture 65 - Keypoints of Maternal, Infant and Young Child Nutrition

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- Lecture 30 - àà|à¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà° : àà, à¥.ààààà" àà à¥ àà°àà àà;àà¼àà"àà¼ àà àà° àà-àà à¥.àà àà
- Lecture 31 - àààà¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà° : àà àà"à¥.àà- àà°àà°àà¼àà°àà°à¥.ààà¥ àà-àà¿àà àà|à¥.
- Lecture 32 - àà à¥ àà¥àà¼ àà²à¥ àà à¥.àà àà° : àà à¥.àà°à¥ àà, àà à¥.àà°à¥ àà;àà² àà, à¥.àà¥àà¿ààààà¿ àà àà° àà
- Lecture 33 - àà°àà¼àà àà ààµàà¼ àà²à¥ àà à¥.àà àà° : àà à¥.àà°à¥ àà, àà à¥.àà°à¥ àà;àà² àà, à¥.àà¥àà¿ààààà¿ ààààà¿ àà°
- Lecture 34 - àà àà àà¼ àà²à¥ àà à¥.àà àà° : àà, à¥.àà¥àà¿àà¿ààààà¿ àà àà° àà àà¹àà°à¥ àà à¥.àà;àà¼àà¼ààµ àà à¥
- Lecture 35 - àà°àà¹àà²àà¼ àà²à¥ àà à¥.àà àà°-àà : àà, à¥.ààààà"àà°àà¼àà" àà à¥ àà²àà¿àà. àà«à¥.àà àà-à¥ àà²
- Lecture 36 - àà|à¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà°-àà : àà.àà ààààà°àà« àà²à¥ àà àà àà° àà, à¥.ààààà"àà°àà¼àà
- Lecture 37 - àààà¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà°-àà : àà, à¥.ààààà"àà°àà¼àà" àà àà¼àà°àà à¥ àà àà àà° àà àà"àà
- Lecture 38 - àà à¥ àà¥àà¼ àà²à¥ àà à¥.àà àà° : àà à¥ ààµàà¿àà; - 19 àà à¥ àà|à¥ àà°àà¼àà" àà, à¥.ààààà"àà°àà¼
- Lecture 39 - àà°àà¼àà àà ààµàà¼ àà²à¥ àà à¥.àà àà°-àà : àà¹àà¼àà¥ àà, à¥ àà, à¥.ààààà" àà àà¼ àà|à¥ àà§ àà"àà
- Lecture 40 - àà àà àà¼ àà²à¥ àà à¥.àà àà°-àà : àà, à¥.ààààà"àà°àà¼àà" àà àà°àà¼àààà¥ àà°àà¼àà àà àà à¥ àà
- Lecture 41 - àà°àà¹àà²àà¼ àà²à¥ àà à¥.àà àà°-àà : 6 àà, à¥ 24 àà°àà¹à¥ àà"à¥ àà à¥ àà¥àà¿àà¥.àà àà àà àà àà
- Lecture 42 - àà|à¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà°-àà : àà¥àà¿àà¥àà¥. àà àà¼ àà àà¼àà"àà¼ àà-àà"àà¼àà"à¥ àà àà°
- Lecture 43 - àààà¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà°-àà : 6 àà°àà¹à¥ àà"à¥ àà à¥ àà-àà à¥.àà à¥ àà àà à¥ àà²àà¿
- Lecture 44 - àà à¥ àà¥àà¼ àà²à¥ àà à¥.àà àà°-àà : 7 àà°àà¹à¥ àà"à¥ àà à¥ àà-àà à¥.àà à¥ àà àà à¥ àà²àà¿
- Lecture 45 - àà°àà¼àà àà ààµàà¼ àà²à¥ àà à¥.àà àà°-àà : 8 àà, à¥ 11 àà°àà¹à¥ àà"à¥ àà à¥ àà-àà à¥.àà à¥ àà
- Lecture 46 - àà°àà¹àà²àà¼ àà²à¥ àà à¥.àà àà° : àà°à¥ àà°àà àà àà¹àà¼àà° àà à¥ àà|à¥ àà°àà¼àà" àà¹à¥ àà"à¥
- Lecture 47 - àà|à¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà° : 12 àà, à¥ 18 àà°àà¹à¥ àà"à¥ àà à¥ àà-àà à¥.àà à¥ àà àà àà
- Lecture 48 - àààà¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà° : 19 àà, à¥ 24 àà°àà¹à¥ àà"à¥ àà à¥ àà-àà à¥.àà à¥ àà àà àà
- Lecture 49 - àà à¥ àà¥àà¼ àà²à¥ àà à¥.àà àà° : àà-àà à¥.àà à¥ àà àà à¥ àà°àà¼àà°à¥.àà àà¿àà-à¥ àà àà à¥
- Lecture 50 - àà°àà¹àà²àà¼ àà²à¥ àà à¥.àà àà° : àà àà¿àà¥à¥ àà°à¥ àà à¥ àà²àà¿àà. àà¥àà¼àà àà¼àà¹àà¼àà°à¥
- Lecture 51 - àà|à¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà° : àà àà°à¥.àà-ààµààààà¿àà-à¥ àà àà à¥ àà²àà¿àà. àà°à¥ àà.à¥
- Lecture 52 - àààà¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà° : àà, à¥.ààààà"àà°àà¼àà" àà àà°àà¼àà"à¥ ààµàà¼àà²à¥ àà°àà¼àà
- Lecture 53 - àà°àà¹àà²àà¼ àà²à¥ àà à¥.àà àà° : àà;àà-à¥.àà²à¥.àà-à¥ àà.àà àà àà-àà¹à¥.àà à¥ àà àà|à¥.àà°à¥
- Lecture 54 - àà|à¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà° : àà°àà¼àà"àà àà, àà¼àà°àà¼àà"à¥.àà- ààµàà¿àà àà²àà" | àà;àà-àà
- Lecture 55 - àààà¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà° : àà;àà-à¥.àà²à¥.àà-à¥ àà.àà àà -àà àà°à¥.àà° àà à¥ àà¹àà¿àà, àà
- Lecture 56 - àà à¥ àà¥àà¼ àà²à¥ àà à¥.àà àà° : àà.àà àà¥à¥.àà°à¥ àà°à¥ àà°à¥ àà à¥.àà°àà¿àà àà°àà¼àà°
- Lecture 57 - àà°àà¹àà²àà¼ àà²à¥ àà à¥.àà àà° : àà, à¥.ààààà"àà°àà¼àà" àà à¥ àà²àà¿àà. à¥°à¥« àà°àà°àà¼àà°àà°
- Lecture 58 - àà|à¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà° : àà, à¥.ààààà"àà°àà¼àà" àà à¥ àà²àà¿àà. à¥°à¥« àà°àà°àà¼àà°àà°
- Lecture 59 - àààà¥ àà, àà°àà¼ àà²à¥ àà à¥.àà àà° : àà°à¥ àà.ààà¥ àà àà¼àà°à¥.àà
- Lecture 60 - àà à¥ àà¥àà¼ àà²à¥ àà à¥.àà àà° : àà²àà°à¥.àà"àà¿àà àà àà.àà à¥.àà¥àà" àà°à¥ àà à¥ àà
- Lecture 61 - àà°àà¼àà àà ààµàà¼ àà²à¥ àà à¥.àà àà° : àà²àà°à¥.àà"àà¿àà àà àà.àà à¥.àà¥àà" àà°à¥.àà°à¥ àà à¥
- Lecture 62 - àà àà àà¼ àà²à¥ àà à¥.àà àà° : àà°àà¼àààà¥, àà¥àà¿àà¥àà¥. àà àà° àà-àà¼àà² àà°à¥ àà.ààà¥ àà à¥

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NPTEL Video Course - Biotechnology - Enzyme Science and Engineering

Subject Co-ordinator - Prof. Subhash Chand

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction and Scope to Enzyme Science and Engineering
- Lecture 2 - Characteristic Features of Enzymes
- Lecture 3 - Enzymes as Biocatalysts
- Lecture 4 - Enzymatic Catalysis
- Lecture 5 - Specificity of Enzyme Action
- Lecture 6 - Kinetics of Enzyme Catalyzed Reactions
- Lecture 7 - Kinetics of Enzyme Catalyzed Reactions
- Lecture 8 - Deviation from Hyperbolic Enzyme Kinetics
- Lecture 9 - Role of Effector Molecules in Enzyme Kinetics
- Lecture 10 - Reversible Inhibition
- Lecture 11 - Effect of PH and Temperature on Enzyme
- Lecture 12 - Kinetics of Bi substrate Enzyme
- Lecture 13 - Kinetics of Bi substrate Enzyme
- Lecture 14 - Immobilized Enzymes - I
- Lecture 15 - Immobilized Enzymes - II
- Lecture 16 - Immobilized Enzymes - III
- Lecture 17 - Immobilization of Enzymes by Entrapment
- Lecture 18 - Effect of Immobilization
- Lecture 19 - Reactors for Enzyme Catalyzed Reactions
- Lecture 20 - Idealized Enzyme Reactor Performance
- Lecture 21 - Idealized Enzyme Reactor Performance
- Lecture 22 - Kinetic Parameters for IME Systems
- Lecture 23 - Steady State Analysis of Mass Transfer
- Lecture 24 - Steady State Analysis of Mass Transfer
- Lecture 25 - Non Ideal Flow in Continuous Immobilized Enzyme
- Lecture 26 - Applications of Immobilized Enzymes in Process
- Lecture 27 - Analytical Applications
- Lecture 28 - Enzyme Technology Challenges

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NPTEL Video Course - Biotechnology - NOC:Healthcare Entrepreneurship

Subject Co-ordinator - Prof. Arnab Chanda

Co-ordinating Institute - IIT Delhi

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

Lecture 1
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Lecture 4
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Lecture 6
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Lecture 8
Lecture 9
Lecture 10
Lecture 11
Lecture 12
Lecture 13
Lecture 14
Lecture 15
Lecture 16
Lecture 17
Lecture 18
Lecture 19
Lecture 20
Lecture 21
Lecture 22
Lecture 23
Lecture 24
Lecture 25
Lecture 26
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Lecture 28
Lecture 29

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Lecture 41
Lecture 42
Lecture 43

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

NPTEL Video Course - Biotechnology - NOC:Introduction to Dynamical Models in Biology

Subject Co-ordinator - Prof. Biplab Bose

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Mathematical modeling in Biology
- Lecture 2 - How to Start Modeling
- Lecture 3 - Modeling the spread of infectious disease
- Lecture 4 - Modeling population growth
- Lecture 5 - Numerical solution of ODE-1
- Lecture 6 - Numerical solution of ODE-2
- Lecture 7 - Simulating ODE-based models
- Lecture 8 - Simulating ODE-based models
- Lecture 9 - Steady state and stability analysis
- Lecture 10 - Steady state and stability analysis
- Lecture 11 - Phase Plane Analysis - I
- Lecture 12 - Phase Plane Analysis - II
- Lecture 13 - Concepts of Bifurcation
- Lecture 14 - Concepts of Bifurcation
- Lecture 15 - Modeling Molecular Processes in Cell
- Lecture 16 - Modeling Molecular Processes in Cell
- Lecture 17 - Modeling Molecular Processes in Cell
- Lecture 18 - Modeling Molecular Processes in Cell
- Lecture 19 - Modeling Cell Signaling
- Lecture 20 - Modeling Cell Signaling
- Lecture 21 - Modeling Cell Signaling
- Lecture 22 - Modeling Transcriptional Circuits-1
- Lecture 23 - Modeling Transcriptional Circuits-2
- Lecture 24 - Online Resources for Mathematical Modeling in Biology

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NPTEL Video Course - Biotechnology - NOC:Genetic Engineering: Theory and Application

Subject Co-ordinator - Dr. Vishal Trivedi

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Cellular Structure - Part I
- Lecture 2 - Cellular Structure - Part II
- Lecture 3 - Cellular Structure - Part III
- Lecture 4 - Metabolic Reactions in Biological System
- Lecture 5 - Growth Media For Different Expression System
- Lecture 6 - Microbial Growth Kinetics
- Lecture 7 - Isolation of a Gene Fragment - Part I
- Lecture 8 - Isolation of a Gene Fragment - Part II
- Lecture 9 - Isolation of a Gene Fragment - Part III
- Lecture 10 - Polymerase Chain Reaction
- Lecture 11 - Molecular Tools for Cloning
- Lecture 12 - Cloning Vectors - I
- Lecture 13 - Cloning Vectors - II
- Lecture 14 - DNA Delivery In Host - Part I
- Lecture 15 - DNA Delivery In Host - Part II
- Lecture 16 - Screening of Recombinant Clones
- Lecture 17 - Protein Production in Host - Part 1
- Lecture 18 - Protein Production in Host - Part 2
- Lecture 19 - Protein Production in Host - Part 3
- Lecture 20 - Product Recovery from Host Cells
- Lecture 21 - Basics of Chromatography - Part 1
- Lecture 22 - Basics of Chromatography - Part 2
- Lecture 23 - Ion-exchange Chromatography
- Lecture 24 - Hydrophobic Interaction Chromatography
- Lecture 25 - Gel Filtration chromatography - Part 1
- Lecture 26 - Gel Filtration chromatography - Part 2
- Lecture 27 - Affinity Chromatography - Part 1
- Lecture 28 - Affinity Chromatography - Part 2
- Lecture 29 - Affinity Chromatography - Part 3

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- Lecture 30 - Affinity Chromatography - Part 4
- Lecture 31 - Electrophoresis - Part 1
- Lecture 32 - Electrophoresis - Part 2
- Lecture 33 - Electrophoresis - Part 3
- Lecture 34 - Protein Sequencing
- Lecture 35 - Spectroscopy - Part I
- Lecture 36 - Spectroscopy - Part II
- Lecture 37 - Biotechnology Applications - Part 1
- Lecture 38 - Biotechnology Applications - Part 2
- Lecture 39 - Biotechnology Applications - Part 3
- Lecture 40 - Summary and Conclusions - Part 1
- Lecture 41 - Summary and Conclusions - Part 2

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

NPTEL Video Course - Biotechnology - NOC:Experimental Biotechnology

Subject Co-ordinator - Dr. Vishal Trivedi

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Good Lab Practices - Part 1
Lecture 2 - Good Lab Practices - Part 2
Lecture 3 - Operation of Laboratory Instruments - Part 1
Lecture 4 - Operation of Laboratory Instruments - Part 2
Lecture 5 - Operation of Laboratory Instruments - Part 3
Lecture 6 - Solution and Buffer Preparation
Lecture 7 - Basics of Electrophoresis - Part 1
Lecture 8 - Basics of Electrophoresis - Part 2
Lecture 9 - Horizontal Gel Electrophoresis
Lecture 10 - Different Variants of Gel Electrophoresis
Lecture 11 - Scientific Questions - Part 1
Lecture 12 - Scientific Questions - Part 2
Lecture 13 - Scientific Questions - Part 3
Lecture 14 - Scientific Questions - Part 4
Lecture 15 - Basics of Chromatography - Part 1
Lecture 16 - Basics of Chromatography - Part 2
Lecture 17 - Ion-Exchange Chromatography - Part 1
Lecture 18 - Ion-Exchange Chromatography - Part 2
Lecture 19 - Hydrophobic Interaction Chromatography
Lecture 20 - Gel Filtration Chromatography - Part 1
Lecture 21 - Gel Filtration Chromatography - Part 2
Lecture 22 - Gel Filtration Chromatography - Part 3
Lecture 23 - Affinity Chromatography - Part 1
Lecture 24 - Affinity Chromatography - Part 2
Lecture 25 - Affinity Chromatography - Part 3
Lecture 26 - Affinity Chromatography - Part 4
Lecture 27 - Antibody Generation
Lecture 28 - Antibody-Antigen Interaction - Part 1
Lecture 29 - Immunoassay

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- Lecture 30 - Antibody-Antigen Interaction - Part 2
- Lecture 31 - Antibody-Antigen Interaction - Part 3
- Lecture 32 - Cell Culture Medium
- Lecture 33 - Cell Fractionation
- Lecture 34 - Microscopy - Part 1
- Lecture 35 - Microscopy - Part 2
- Lecture 36 - Cell Biology Experiments
- Lecture 37 - Flow Cytometry
- Lecture 38 - Polymerase Chain Reaction - Part 1
- Lecture 39 - Polymerase Chain Reaction - Part 2
- Lecture 40 - Polymerase Chain Reaction - Part 3
- Lecture 41 - Polymerase Chain Reaction - Part 4
- Lecture 42 - Sequencing Techniques
- Lecture 43 - Blotting Techniques - Part 1
- Lecture 44 - Blotting Techniques - Part 2
- Lecture 45 - Designing Experiments

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

NPTEL Video Course - Biotechnology - NOC:Biointerface Engineering

Subject Co-ordinator - Prof. Lalit M. Pandey

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Intermolecular Forces
- Lecture 2 - Classification of Intermolecular Forces
- Lecture 3 - Thermodynamics Aspects of Intermolecular Forces
- Lecture 4 - Surface Tension and Energy
- Lecture 5 - Wettability
- Lecture 6 - Adhesion and Cohesion
- Lecture 7 - Methods for Surface Tension Measurement
- Lecture 8 - Methods for Contact Angle Measurement
- Lecture 9 - Determination of Surface Tension of Solids
- Lecture 10 - Protein Adsorption
- Lecture 11 - Characterization of Protein Adsorption
- Lecture 12 - Kinetics of Protein Adsorption
- Lecture 13 - Aggregation of Proteins
- Lecture 14 - Kinetics of Protein Aggregation
- Lecture 15 - Effect of Surfaces on the Aggregation of Protein
- Lecture 16 - Host Responses to Biomaterials
- Lecture 17 - Cell Adhesion
- Lecture 18 - Biocompatibility of Biomaterials
- Lecture 19 - Surface Modification
- Lecture 20 - Surface Modification Techniques
- Lecture 21 - Coating of Calcium Phosphates on Ti-6Al-4V
- Lecture 22 - Surface Characterization
- Lecture 23 - Self-Assembled Monolayers
- Lecture 24 - Effect of SAMs on Biointerfacial Interactions

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NPTEL Video Course - Biotechnology - NOC:Basics of Biology

Subject Co-ordinator - Prof. Vishal Trivedi

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction to Living Organisms
Lecture 2 - Classification of Living Organisms - Part 1
Lecture 3 - Classification of Living Organisms - Part 2
Lecture 4 - Classification of Living Organisms - Part 3
Lecture 5 - Classification of Living Organisms - Part 4
Lecture 6 - Origin of Life - Part 1
Lecture 7 - Origin of Life - Part 2
Lecture 8 - Evolution - Part 1
Lecture 9 - Evolution - Part 2
Lecture 10 - Evolution - Part 3
Lecture 11 - Basics of Cells - Part 1
Lecture 12 - Basics of Cells - Part 2
Lecture 13 - Basics of Cells - Part 3
Lecture 14 - Cell Division and regulation
Lecture 15 - Nucleic acids
Lecture 16 - Carbohydrates - Part 1
Lecture 17 - Carbohydrates - Part 2
Lecture 18 - Carbohydrates - Part 3
Lecture 19 - Lipids
Lecture 20 - Proteins - Part 1
Lecture 21 - Proteins - Part 2
Lecture 22 - Proteins - Part 3
Lecture 23 - Proteins - Part 4
Lecture 24 - Central Dogma of Life
Lecture 25 - Replication
Lecture 26 - Polymerase chain reaction
Lecture 27 - Transcription - Part 1
Lecture 28 - Transcription - Part 2
Lecture 29 - Translation - Part 1

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

- Lecture 30 - Translation - Part 2
- Lecture 31 - Immune system - Part 1
- Lecture 32 - Immune system - Part 2
- Lecture 33 - Phagocytosis
- Lecture 34 - Cell Death and Apoptosis
- Lecture 35 - Vesicular Transport
- Lecture 36 - Digestion - Part 1
- Lecture 37 - Digestion - Part 2
- Lecture 38 - Digestion - Part 3
- Lecture 39 - Circulatory System - Part 1
- Lecture 40 - Circulatory System - Part 2
- Lecture 41 - Muscular System - Part 1
- Lecture 42 - Muscular System - Part 2
- Lecture 43 - Nervous System - Part 1
- Lecture 44 - Nervous System - Part 2
- Lecture 45 - Nervous System - Part 3
- Lecture 46 - Homeostasis - Part 1
- Lecture 47 - Homeostasis - Part 2
- Lecture 48 - Homeostasis - Part 3
- Lecture 49 - Summary and Conclusions - Part 1
- Lecture 50 - Summary and Conclusions - Part 2

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

NPTEL Video Course - Biotechnology - NOC:Data Analysis for Biologists

Subject Co-ordinator - Prof. Biplab Bose

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Rules of probability
- Lecture 2 - Discrete probability distribution
- Lecture 3 - Continuous probability distribution
- Lecture 4 - Moments: mean and variance
- Lecture 5 - Moments: variance and covariance
- Lecture 6 - Bayes theorem and likelihood
- Lecture 7 - Concept of statistical tests
- Lecture 8 - Vector and vector operations
- Lecture 9 - Matrix and matrix operations
- Lecture 10 - Determinant and Inverse of a matrix
- Lecture 11 - Eigenvalue and eigenvector
- Lecture 12 - Linear system of equations
- Lecture 13 - Singular value decomposition
- Lecture 14 - Getting ready with R
- Lecture 15 - Algebraic and logical operations in R
- Lecture 16 - Reading and writing data
- Lecture 17 - Statistics using R - descriptive statistics
- Lecture 18 - Statistics using R - t-test and ANOVA
- Lecture 19 - Linear algebra using R
- Lecture 20 - Scatter plot, Line plot and Bar plot
- Lecture 21 - Histogram and Box plot
- Lecture 22 - Heatmap and Volcano plot
- Lecture 23 - Network visualization
- Lecture 24 - Data visualization using ggplot2 - I
- Lecture 25 - Data visualization using ggplot2 - II
- Lecture 26 - Correlations
- Lecture 27 - Linear regression - I
- Lecture 28 - Linear regression - II
- Lecture 29 - Linear regression using R

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

- Lecture 30 - Multiple linear regression
- Lecture 31 - Multiple linear regression using R
- Lecture 32 - Nonlinear regression
- Lecture 33 - Nonlinear regression using R
- Lecture 34 - Clustering and classification
- Lecture 35 - Logistic regression
- Lecture 36 - Logistic regression using R
- Lecture 37 - Distance measures for clustering
- Lecture 38 - k-means clustering
- Lecture 39 - k-means clustering using R
- Lecture 40 - Hierarchical clustering
- Lecture 41 - Hierarchical clustering using R
- Lecture 42 - Decision tree classifier
- Lecture 43 - Support vector machines
- Lecture 44 - Higher-dimensional data in biology
- Lecture 45 - Principle component analysis
- Lecture 46 - Principle component analysis using R
- Lecture 47 - t-SNE
- Lecture 48 - t-SNE using R
- Lecture 49 - Diffusion maps

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

NPTEL Video Course - Biotechnology - NOC:Genome Editing and Engineering

Subject Co-ordinator - Prof. Utpal Bora

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction: Genes and Genome Organization
- Lecture 2 - History and Basics of Genetic Engineering
- Lecture 3 - Advantages and Limitations of Genetic Engineering
- Lecture 4 - Breakage of Genomic DNA
- Lecture 5 - Repair of Genomic DNA
- Lecture 6 - Homologous and non homologous recombination
- Lecture 7 - Site specific recombination
- Lecture 8 - Targeted genetic modification - I
- Lecture 9 - Targeted genetic modification - II
- Lecture 10 - Basics of Zinc Finger Nucleases
- Lecture 11 - Design of Zinc Finger Nucleases for genome editing
- Lecture 12 - Applications of Zinc Finger Nucleases - Part A
- Lecture 13 - Applications of Zinc Finger Nucleases - Part B
- Lecture 14 - Basics of TALEN - Part A
- Lecture 15 - Basics of TALEN - Part B
- Lecture 16 - Design of TALEN for genome editing - Part A
- Lecture 17 - Design of TALEN for genome editing - Part B
- Lecture 18 - Application of TALEN - Part A
- Lecture 19 - Application of TALEN - Part B
- Lecture 20 - CRISPR system in bacteria - Part A
- Lecture 21 - CRISPR system in bacteria - Part B
- Lecture 22 - CRISPR/Cas9 in Genome Editing - Part A
- Lecture 23 - CRISPR/Cas9 in Genome Editing - Part B
- Lecture 24 - Applications of CRISPR/Cas9 - Part A
- Lecture 25 - Applications of CRISPR/Cas9 - Part B
- Lecture 26 - Computational Resources for CRISPR / Cas - Part A
- Lecture 27 - Computational Resources for CRISPR / Cas - Part B
- Lecture 28 - Human cell engineering in diseases : Thalassemia - Part A
- Lecture 29 - Human cell engineering in diseases : Thalassemia - Part B

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

- Lecture 30 - Human cell engineering in diseases : Severe combined immunodeficiency (SCID) - Part A
- Lecture 31 - Human cell engineering in diseases : Severe combined immunodeficiency (SCID) - Part B
- Lecture 32 - Human cell engineering in diseases : Hemophilia - Part A
- Lecture 33 - Human cell engineering in diseases : Hemophilia - Part B
- Lecture 34 - Animal models - Part A
- Lecture 35 - Animal models - Part B
- Lecture 36 - iPSc models - Part A
- Lecture 37 - iPSc models - Part B
- Lecture 38 - Cancer disease models - Part A
- Lecture 39 - Cancer disease models - Part B
- Lecture 40 - Engineered immune cells for Cancer therapy (I) - Part A
- Lecture 41 - Engineered immune cells for Cancer therapy (I) - Part B
- Lecture 42 - Engineered immune cells for Cancer therapy (II) - Part A
- Lecture 43 - Engineered immune cells for Cancer therapy (II) - Part B
- Lecture 44 - History and Basics - Part A
- Lecture 45 - History and Basics - Part B
- Lecture 46 - Genome editing and personalized therapy
- Lecture 47 - Bioethics and Biosafety - Part A
- Lecture 48 - Bioethics and Biosafety - Part B
- Lecture 49 - Regulatory issues in Genome Editing

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

NPTEL Video Course - Biotechnology - NOC:Enzyme Sciences and Technology

Subject Co-ordinator - Prof. Vishal Trivedi

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction to Enzymes
- Lecture 2 - Basics of Enzyme
- Lecture 3 - Enzyme Classification - Part I
- Lecture 4 - Enzyme Classification - Part II
- Lecture 5 - Enzyme Nomenclature
- Lecture 6 - Primary Structure of Enzyme
- Lecture 7 - Determination of Primary Structure
- Lecture 8 - Secondary Structure of Protein
- Lecture 9 - Tertiary Structure of Enzyme - Part I
- Lecture 10 - Tertiary Structure of Enzyme - Part II
- Lecture 11 - Molecular Modelling of Enzyme Structure - Part II
- Lecture 12 - Identification of Enzyme Gene - Part II
- Lecture 13 - Identification of Enzyme Gene - Part II
- Lecture 14 - Polymerase Chain Reaction
- Lecture 15 - Enzymes in Molecular Cloning
- Lecture 16 - Cloning of Enzyme Coding Gene
- Lecture 17 - DNA Delivery in host - Part I
- Lecture 18 - DNA Delivery in host - Part II
- Lecture 19 - Screening of Recombinant Clones
- Lecture 20 - Over-expression of Enzyme in host - Part I
- Lecture 21 - Over-expression of Enzyme in host - Part II
- Lecture 22 - Over-expression of Enzyme in host - Part III
- Lecture 23 - Host Cell Disruption Methods
- Lecture 24 - Basics of Chromatography
- Lecture 25 - Chromatography - Part I
- Lecture 26 - Chromatography - Part II
- Lecture 27 - Chromatography - Part III
- Lecture 28 - Carbohydrate Metabolism
- Lecture 29 - Lipid Metabolism

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

- Lecture 30 - Amino acid Metabolism and Detoxification
- Lecture 31 - Enzyme-Substrate Interactions - Part I - Chromatographic Methods
- Lecture 32 - Enzyme-Substrate Interactions - Part II - Spectroscopic Methods
- Lecture 33 - Enzyme-Substrate Interactions - Part III - ITC
- Lecture 34 - Enzyme-Substrate Interactions - Part IV - SPR
- Lecture 35 - Enzyme Assay System - Part I
- Lecture 36 - Enzyme Assay System - Part II
- Lecture 37 - Enzyme Assay System - Part III
- Lecture 38 - Enzyme Kinetics
- Lecture 39 - Inhibitor Designing - Part I - Traditional Approach
- Lecture 40 - Inhibitor Designing - Part II - Modern Approach
- Lecture 41 - Inhibitor Designing - Part III - Computational Approach
- Lecture 42 - Enzyme Inhibition - Part I
- Lecture 43 - Enzyme Inhibition - Part II
- Lecture 44 - Application of Enzyme - Part I - Food Industry
- Lecture 45 - Application of Enzyme - Part II - Medical Field
- Lecture 46 - Enzyme in Drug Discovery
- Lecture 47 - Enzymes in Environmental Field

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

NPTEL Video Course - Biotechnology - NOC:Molecular Biology

Subject Co-ordinator - Prof. Vishal Trivedi

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Cellular Structure (Prokaryotic cells)
Lecture 2 - Cellular Structure (Eukaryotic cells)
Lecture 3 - Cellular Structure (Eukaryotic cells)
Lecture 4 - Cell Fractionation - Part 1
Lecture 5 - Cell Fractionation - Part 2
Lecture 6 - Cellular Metabolism - Part 1
Lecture 7 - Cellular Metabolism - Part 2
Lecture 8 - Cell Cycle and Control - Part 1
Lecture 9 - Cell Cycle and Control - Part 2
Lecture 10 - Program Cell Death
Lecture 11 - Biomolecules - Part 1 : DNA
Lecture 12 - Biomolecules - Part 2 : DNA Sequencing
Lecture 13 - Biomolecules - Part 2 : RNA
Lecture 14 - Amino acids
Lecture 15 - Protein
Lecture 16 - Enzymes
Lecture 17 - Genetic Material - Part 1
Lecture 18 - Genetic Material - Part 2
Lecture 19 - Genetic Material - Part 3
Lecture 20 - Central Dogma of Molecular Biology
Lecture 21 - Replication - Part 1 : Prokaryotic System
Lecture 22 - Replication - Part 2 : Prokaryotic System
Lecture 23 - Replication - Part 2 : Eukaryotic System
Lecture 24 - Mutagenesis and repair Mechanism
Lecture 25 - Transcription in Prokaryotic system
Lecture 26 - Transcription in Eukaryotic System
Lecture 27 - Post Transcriptional modifications
Lecture 28 - Gene Control Mechanism - Part 1
Lecture 29 - Gene Control Mechanism - Part 2

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

- Lecture 30 - Translation in Prokaryotic system
- Lecture 31 - Translation in Eukaryotic System
- Lecture 32 - Post Translational modifications
- Lecture 33 - Southern Blotting
- Lecture 34 - Northern Blotting
- Lecture 35 - Western Blotting - Part 1
- Lecture 36 - Western Blotting - Part 2
- Lecture 37 - Polymerase Chain Reaction - Part 1
- Lecture 38 - Polymerase Chain Reaction - Part 2
- Lecture 39 - Real-Time PCR
- Lecture 40 - Cloning - Part 1
- Lecture 41 - Cloning - Part 2
- Lecture 42 - Cloning Vectors
- Lecture 43 - DNA Delivery - Part 1
- Lecture 44 - DNA Delivery - Part 2
- Lecture 45 - Screening of Recombinant Clones
- Lecture 46 - Protein Over-expression
- Lecture 47 - Genome Editing - Part 1
- Lecture 48 - Genome Editing - Part 2
- Lecture 49 - Applications of Molecular Biology - Part 1
- Lecture 50 - Applications of Molecular Biology - Part 2
- Lecture 51 - Applications of Molecular Biology - Part 3
- Lecture 52 - Applications of Molecular Biology - Part 4

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

NPTEL Video Course - Biotechnology - NOC:Microbial Biotechnology

Subject Co-ordinator - Prof. Utpal Bora

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction and principles of microbial biotechnology

Lecture 2 - Classification and taxonomy of microbes A

Lecture 3 - Classification and taxonomy of microbes B

Lecture 4 - Techniques for microbial Classification and Identification

Lecture 5 - Structure, life cycle and classification of viruses

Lecture 6 - Structure and life cycle of representative groups of prokaryotic microbes

Lecture 7 - Structure of cyanobacteria and archaea

Lecture 8 - Diversity and Structure of selected eukaryotic microorganisms

Lecture 9 - Life cycle of representative groups of microbes

Lecture 10 - Basic Physiology of Microorganisms

Lecture 11 - Physiology of Extremophiles and adaptation-energy storage, temperature, pH and pressure

Lecture 12 - Physiology of Extremophiles and adaptation-halophiles, xerophiles, radiophiles and metallaphiles

Lecture 13 - Genome structure, transcription, genetic code, translation

Lecture 14 - Regulation of gene expression

Lecture 15 - Microbial growth kinetics

Lecture 16 - Control methods: Physical methods

Lecture 17 - Control methods: Chemical methods

Lecture 18 - Control methods: Biological methods

Lecture 19 - Microorganisms in industry

Lecture 20 - Microorganisms in pharmaceutical industry

Lecture 21 - Microbial Enzymes of Industrial Importance

Lecture 22 - Engineered Microbial Consortia for Industry

Lecture 23 - Microbes in Agriculture

Lecture 24 - Microbial Biocontrol

Lecture 25 - Biopesticides and Integrated Pest Management

Lecture 26 - Microbial ecology, biogeochemical cycles

Lecture 27 - Microbial waste treatment methods

Lecture 28 - Microbial Bioremediation

Lecture 29 - Fermented Food - Foundations and Principles

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

- Lecture 30 - Health Benefits, Risks and Advances in Food Fermentation
- Lecture 31 - Fermented Beverages: Microbial Processes and Biotechnological Innovations
- Lecture 32 - Industrial Fermentation and Health Aspects of Fermented Beverages
- Lecture 33 - Single Cell Protein production
- Lecture 34 - Production of biopharmaceuticals (Enzymes, antibodies and therapeutic proteins) using rDNA technology
- Lecture 35 - Production of vaccines
- Lecture 36 - Production of Biofuel using microbes
- Lecture 37 - Microbial fuel Cells (MFCs) and microbial electrolysis cells (MECs)
- Lecture 38 - Introduction to IPR, biotechnology patents, app. process, legal and ethical considerations
- Lecture 39 - Patenting in microbial biotechnology, commercialization and future of microbial patenting

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

NPTEL Video Course - Biotechnology - NOC:Cell and Molecular Biology

Subject Co-ordinator - Prof. Vishal Trivedi

Co-ordinating Institute - IIT Guwahati

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

- Lecture 1 - Origin of Life - Part 1
- Lecture 2 - Origin of Life - Part 2
- Lecture 3 - Basics of Evolution
- Lecture 4 - Theories of Evolution - Part 1
- Lecture 5 - Theories of Evolution - Part 2
- Lecture 6 - Prokaryotic Cells
- Lecture 7 - Eukaryotic Cells - Part 1
- Lecture 8 - Eukaryotic Cells - Part 2
- Lecture 9 - Cell Growth and regulation
- Lecture 10 - Cell Growth Medium
- Lecture 11 - Cell Growth Monitoring
- Lecture 12 - Cell Cycle
- Lecture 13 - Mitosis and Meiosis
- Lecture 14 - Apoptosis and Autophagy
- Lecture 15 - Transport in Prokaryotic Cells
- Lecture 16 - Transport in Eukaryotic Cells - Part 1
- Lecture 17 - Transport in Eukaryotic Cells - Part 2
- Lecture 18 - Cellular Communication - Part 1
- Lecture 19 - Cellular Communication - Part 2
- Lecture 20 - Cellular Communication - Part 3
- Lecture 21 - Genetic Material in Organism
- Lecture 22 - Organization of Genome - Part 1
- Lecture 23 - Organization of Genome - Part 2
- Lecture 24 - Genome Damage and Repair Mechanism
- Lecture 25 - Law of Inheritance - Part 1
- Lecture 26 - Law of Inheritance - Part 2
- Lecture 27 - Epigenetics
- Lecture 28 - Genetic Recombination
- Lecture 29 - Transgenic Organisms

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

- Lecture 30 - Gene Regulation in Organism
- Lecture 31 - Structure of DNA - Part 1
- Lecture 32 - Structure of DNA - Part 2
- Lecture 33 - Structure of RNA
- Lecture 34 - Central Dogma of Molecular Biology
- Lecture 35 - Replication - Part 1
- Lecture 36 - Replication - Part 2
- Lecture 37 - Replication - Part 3
- Lecture 38 - Transcription - Part 1
- Lecture 39 - Transcription - Part 2
- Lecture 40 - Translation
- Lecture 41 - Components of Immune System
- Lecture 42 - Antibody
- Lecture 43 - Vaccines
- Lecture 44 - Gene Therapy
- Lecture 45 - Cell Factory: Concept and Application
- Lecture 46 - Summary and Conclusion

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

NPTEL Video Course - Biotechnology - NOC:Fundamentals of Bioprocess Engineering

Subject Co-ordinator - Prof. Lalit Pandey

Co-ordinating Institute - IIT Guwahati

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

- Lecture 1 - Overview of Fermentation Process
- Lecture 2 - Strain Isolation and Process Flow
- Lecture 3 - Metabolic Pathways
- Lecture 4 - Cell Nutrients
- Lecture 5 - Industrial Important Products
- Lecture 6 - Material and mass balance
- Lecture 7 - Stoichiometry of cell growth and product formation
- Lecture 8 - Stoichiometry of cell growth and product formation
- Lecture 9 - Stoichiometry of product formation
- Lecture 10 - Metabolic energetics
- Lecture 11 - Energy balance
- Lecture 12 - Basic of Enzyme catalysis
- Lecture 13 - Michaelis Menten Equation
- Lecture 14 - Evaluation of kinetic Parameters
- Lecture 15 - Enzyme Inhibition - 1
- Lecture 16 - Enzyme Inhibition - 2
- Lecture 17 - Immobilization of Enzymes
- Lecture 18 - External Mass Transfer
- Lecture 19 - Internal Mass Transfer
- Lecture 20 - Simultaneous External and Internal mass Transfer
- Lecture 21 - Application of Immobilized Enzyme
- Lecture 22 - Microbial Growth Kinetics
- Lecture 23 - Monod Equation
- Lecture 24 - Transient Growth Kinetics - 1
- Lecture 25 - Transient Growth Kinetics - 2
- Lecture 26 - Primary and Secondary Metabolites
- Lecture 27 - Structured kinetic model for product formation
- Lecture 28 - Structured kinetic model - II
- Lecture 29 - Product formation kinetics - I

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

- Lecture 30 - Product formation kinetics - II
- Lecture 31 - Ideal reactor operation - Batch fermentation
- Lecture 32 - Ideal reactor operation - fed batch and continuous with free cells
- Lecture 33 - Ideal reactor operation - CSTR
- Lecture 34 - Special Bioreactors
- Lecture 35 - Mass transfer and diffusion related theories
- Lecture 36 - Oxygen transfer from bubble to cell
- Lecture 37 - Measurement of mass transfer coefficient
- Lecture 38 - Role of Agitation
- Lecture 39 - Heat transfer in bioprocessing
- Lecture 40 - Cell death kinetics
- Lecture 41 - Batch and continuous sterilization
- Lecture 42 - Heat transfer equipment
- Lecture 43 - Scale up
- Lecture 44 - Sensors for Bioreactor
- Lecture 45 - Measurement of Process Parameter
- Lecture 46 - Process Control System
- Lecture 47 - Process Dynamic
- Lecture 48 - Process Controller
- Lecture 49 - Importance of downstream processing
- Lecture 50 - Centrifugation, filtration, sedimentation
- Lecture 51 - Cell separation and disruption
- Lecture 52 - Extraction and chromatography
- Lecture 53 - Adsorption
- Lecture 54 - Membrane separation
- Lecture 55 - Drying
- Lecture 56 - Introduction to bioprocess economics

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

NPTEL Video Course - Biotechnology - Animal Physiology

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Animal Physiology
Lecture 2 - Animal Physiology
Lecture 3 - Animal Physiology
Lecture 4 - Animal Physiology
Lecture 5 - Animal Physiology
Lecture 6 - Animal Physiology
Lecture 7 - Animal Physiology
Lecture 8 - Animal Physiology
Lecture 9 - Animal Physiology
Lecture 10 - Animal Physiology
Lecture 11 - Animal Physiology
Lecture 12 - Animal Physiology
Lecture 13 - Animal Physiology
Lecture 14 - Animal Physiology
Lecture 15 - Animal Physiology
Lecture 16 - Animal Physiology
Lecture 17 - Animal Physiology
Lecture 18 - Animal Physiology
Lecture 19 - Animal Physiology
Lecture 20 - Animal Physiology
Lecture 21 - Animal Physiology
Lecture 22 - Animal Physiology
Lecture 23 - Animal Physiology
Lecture 24 - Animal Physiology
Lecture 25 - Animal Physiology
Lecture 26 - Animal Physiology
Lecture 27 - Animal Physiology
Lecture 28 - Animal Physiology
Lecture 29 - Animal Physiology

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

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

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

NPTEL Video Course - Biotechnology - Bio electricity

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Bio electricity
Lecture 2 - Bio electricity
Lecture 3 - Bio electricity
Lecture 4 - Bio electricity
Lecture 5 - Bio electricity
Lecture 6 - Bio electricity
Lecture 7 - Bio electricity
Lecture 8 - Bio electricity
Lecture 9 - Bio electricity
Lecture 10 - Bio electricity
Lecture 11 - Bio electricity
Lecture 12 - Bio electricity
Lecture 13 - Bio electricity
Lecture 14 - Bio electricity
Lecture 15 - Bio electricity
Lecture 16 - Bio electricity
Lecture 17 - Bio electricity
Lecture 18 - Bio electricity
Lecture 19 - Bio electricity
Lecture 20 - Bio electricity
Lecture 21 - Bio electricity
Lecture 22 - Bio electricity
Lecture 23 - Bio electricity
Lecture 24 - Bio electricity
Lecture 25 - Bio electricity
Lecture 26 - Bio electricity
Lecture 27 - Bio electricity
Lecture 28 - Bio electricity
Lecture 29 - Bio electricity

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Lecture 31 - Bio electricity
Lecture 32 - Bio electricity
Lecture 33 - Bio electricity
Lecture 34 - Bio electricity
Lecture 35 - Bio electricity
Lecture 36 - Bio electricity
Lecture 37 - Bio electricity
Lecture 38 - Bio electricity
Lecture 39 - Bio electricity
Lecture 40 - Bio electricity

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

NPTEL Video Course - Biotechnology - NOC:Human Molecular Genetics

Subject Co-ordinator - Mr.S. Ganesh

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Fundamentals of central dogma, Part 1
- Lecture 2 - Fundamentals of central dogma, Part 2
- Lecture 3 - Fundamentals of central dogma, Part 3
- Lecture 4 - Chromosome Structure and Function
- Lecture 5 - Pedigree Analysis
- Lecture 6 - Complications in Mendelian Pedigree Patterns
- Lecture 7 - DNA Cloning and Hybridization Techniques - Part 1
- Lecture 8 - DNA Cloning and Hybridization Techniques - Part 2
- Lecture 9 - Practice Session 1
- Lecture 10 - Practice Session 2
- Lecture 11 - Mutations and instability of human DNA (Part 1)
- Lecture 12 - Mutations and instability of human DNA (Part 2)
- Lecture 13 - Animal Models for Human Diseases
- Lecture 14 - Positional cloning of genes for monogenic disorders
- Lecture 15 - Human Genome Project and HapMap project

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

NPTEL Video Course - Biotechnology - NOC:Functional Genomics

Subject Co-ordinator - S. Ganesh

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction to Functional Genomics

Lecture 2 - The Genomics Era

Lecture 3 - Epigenetics

Lecture 4 - Forward Genetics vs Reverse Genetics

Lecture 5 - Genome Editing Approaches - Part 1

Lecture 6 - Genome Editing Approaches - Part 2

Lecture 7 - Transcriptomics - Part 1

Lecture 8 - Transcriptomics - Part 2

Lecture 9 - Genome Sequence Databases

Lecture 10 - DNA Sequencing Methods - Part 1

Lecture 11 - DNA Sequencing Methods - Part 2

Lecture 12 - Applications of Next-Generation Sequencing (NGS)

Lecture 13 - Tutorial - Session 1

Lecture 14 - Tutorial - Session 2

Lecture 15 - Genomic Insight into Evolution

Lecture 16 - Genome sequence

Lecture 17 - Outcome of Comparative Genomics

Lecture 18 - Laboratory - Session 1

Lecture 19 - Laboratory - Session 2

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

NPTEL Video Course - Biotechnology - NOC:Bioenergy

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction

Lecture 2 - Oil Economy of the World

Lecture 3 - Unit of Energy and Introduction of Bioenergy

Lecture 4 - How Biomass Formed on the Earth

Lecture 5 - Road Map of Bioenergy

Lecture 6 - Basic Biomass Technology (Resources and Production)

Lecture 7 - Basics of Mechanism of Light Reaction

Lecture 8 - Exploration of Photosynthesis Process

Lecture 9 - In Photosynthesis Oxygen Comes from Water Molecule

Lecture 10 - Hill Reaction

Lecture 11 - Electron Transport Process in Light Reaction

Lecture 12 - How Carbon dioxide converted in Carbohydrate

Lecture 13 - From Carbon dioxide to two Molecules of 3 - Phospho Glycerate by RUBISCO

Lecture 14 - RUBISCO enzyme

Lecture 15 - Photo respiration and Calvin Cycle

Lecture 16 - Efficiency Calculation of Photosynthesis Process

Lecture 17 - C3 and C4 Plant Structure and Photosynthesis Process

Lecture 18 - Biomass production System and their Categorization

Lecture 19 - Important Parameters for Selecting Biomass Crops

Lecture 20 - Factors Determining the Conversion Process - I

Lecture 21 - Factors Determining the Conversion Process - II

Lecture 22 - Factors Determining the Conversion Process - III

Lecture 23 - Conversion Technology

Lecture 24 - Conversion Process- (Combustion Process)

Lecture 25 - Pyrolysis Process

Lecture 26 - Classification of Pyrolysis

Lecture 27 - Bio Oil - (Solution for Thermal Instability and Corrosivity)

Lecture 28 - Spark Ignition Engine

Lecture 29 - Compression Ignition Engine

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

- Lecture 30 - Carbonization - Graphene like material
- Lecture 31 - Introduction of Gasification
- Lecture 32 - Thermo Chemical Process of Gasification
- Lecture 33 - Feed Stock Treatment of Gasification
- Lecture 34 - Feed Stock Property
- Lecture 35 - Gasification Types - Up Drift Gasifier
- Lecture 36 - Down drift and Cross Flow Gasifier
- Lecture 37 - Operation and Performance of Fixed Bed Gasifier
- Lecture 38 - Fluidized Bed Gasification
- Lecture 39 - Operation and Performance of Fluidized Bed Gasifier
- Lecture 40 - Biological Root of Gasification and Summary of Course

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

NPTEL Video Course - Biotechnology - NOC:Animal Physiology

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - An Introduction to Anatomy and Physiology
- Lecture 2 - Organization of living system
- Lecture 3 - Homeostasis and system integration
- Lecture 4 - Positive feedback loop in homeostasis
- Lecture 5 - Chemical basis of organization of the body
- Lecture 6 - Integumentary System - I
- Lecture 7 - Integumentary system - II
- Lecture 8 - Integumentary System - III
- Lecture 9 - Bone and Cartilage - I
- Lecture 10 - Bone and Cartilage - II
- Lecture 11 - Introduction of muscle
- Lecture 12 - Skeletal muscle formation
- Lecture 13 - Anatomy of skeletal muscle
- Lecture 14 - Contraction in muscle
- Lecture 15 - Function of actin and myosin
- Lecture 16 - Length tension relationship of skeletal muscle
- Lecture 17 - Excitation contraction coupling with nervous system
- Lecture 18 - Stretch reflex phenomena
- Lecture 19 - Nervous system anatomy and signaling
- Lecture 20 - Structure and circuit of neurons
- Lecture 21 - Origin of biological cell
- Lecture 22 - Excitability in cell
- Lecture 23 - Ion transportation in the cell
- Lecture 24 - Signal propagation in neurons
- Lecture 25 - Neurotransmitter and action potential
- Lecture 26 - Spatial temporal summation of signal in mesh neurons
- Lecture 27 - Anatomy of Hippo-campus
- Lecture 28 - Epilepsy and memory
- Lecture 29 - Long term potentiation

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

- Lecture 30 - Long term depression
- Lecture 31 - Alzheimers disease
- Lecture 32 - Parkinsons disease
- Lecture 33 - Amyotrophic lateral sclerosis
- Lecture 34 - Spinal cord injury
- Lecture 35 - Glial cells
- Lecture 36 - Stretch reflex arc circuit - I
- Lecture 37 - Stretch reflex arc circuit - II
- Lecture 38 - Neuro muscular junction
- Lecture 39 - Hearing system
- Lecture 40 - Olfaction system
- Lecture 41 - Anatomy of eye
- Lecture 42 - Eye lens and cataract
- Lecture 43 - Structure of Retina
- Lecture 44 - Image formation and processing in eyes
- Lecture 45 - Mechanism of photo processing by rods
- Lecture 46 - Structure and Function of Heart - I
- Lecture 47 - Structure and Function of Heart - II
- Lecture 48 - Conduction circuit of heart
- Lecture 49 - Contractile system and Conducting system
- Lecture 50 - EKG and Comparison of action potential between pace make cell and work cell
- Lecture 51 - Respiratory Physiology
- Lecture 52 - Anatomy and physiology of Blood vessels - I
- Lecture 53 - Anatomy and Physiology of Blood vessels - II
- Lecture 54 - Anatomy and physiology of blood vessels - III
- Lecture 55 - Anatomy and physiology of blood vessels - IV
- Lecture 56 - Endocrine system - I
- Lecture 57 - Digestive system and Endocrine system - II
- Lecture 58 - Blood
- Lecture 59 - Kidney and immune system
- Lecture 60 - Reproductive system

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

NPTEL Video Course - Biotechnology - NOC:Cell Culture Technologies

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction of Cell Culture Technology
- Lecture 2 - Philosophy and complexity in cell culture
- Lecture 3 - To grow the cell outside the body
- Lecture 4 - Cell cycle concept
- Lecture 5 - Dividing cells
- Lecture 6 - Biology of cell culture
- Lecture 7 - Layout(s) and design(s) of cell culture facility
- Lecture 8 - Precautions during designing the lab layout - I
- Lecture 9 - Precautions during designing the lab layout - II
- Lecture 10 - Precautions during designing the lab layout - III
- Lecture 11 - State of the art facility in cell culture lab - I
- Lecture 12 - State of the art facility in cell culture lab - II
- Lecture 13 - Specialized facility in cell culture lab
- Lecture 14 - Interaction of cell and glass/polycarbonate surface - I
- Lecture 15 - Interaction of cell and glass/polycarbonate surface - II
- Lecture 16 - Poly D lysine deposition
- Lecture 17 - Surface chemical analysis
- Lecture 18 - Cell growth process
- Lecture 19 - Cell surface interface
- Lecture 20 - Cell culture substrate patterning
- Lecture 21 - Introduction of define system
- Lecture 22 - Mechanical dissociation of hippocampal tissue
- Lecture 23 - Rules for mechanical dissociation of tissue
- Lecture 24 - Drum molecule testing
- Lecture 25 - Adult hippocampal neuron dissociation
- Lecture 26 - Cell separation and In vitro myelination cell culture mode - I
- Lecture 27 - Cell separation and In vitro myelination cell culture mode - II
- Lecture 28 - Cell separation and In vitro myelination cell culture mode - III
- Lecture 29 - Cell Separation and In vitro myelination cell culture mode - IV

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

- Lecture 30 - Cell separation and in vitro myelination cell culture mode - V
- Lecture 31 - Fluorescent assisted cell sorting
- Lecture 32 - Condition for regenerated cells
- Lecture 33 - Introduction of skeletal muscle cell culture
- Lecture 34 - Skeletal muscle cell culture
- Lecture 35 - Cardiac muscle cell culture
- Lecture 36 - Advance cell culture modules - I
- Lecture 37 - Advance cell culture modules - II
- Lecture 38 - Advance cell culture modules - III
- Lecture 39 - Advance cell culture modules - IV
- Lecture 40 - Advance cell culture modules - V

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

NPTEL Video Course - Biotechnology - NOC:Forest Biometry

Subject Co-ordinator - Prof. Mainak Das, Dr. Ankur Awadhiya

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction
- Lecture 2 - Recap of formulae
- Lecture 3 - Recap of trigonometry
- Lecture 4 - Measurement of central tendency and dispersion
- Lecture 5 - Graphical presentation of data
- Lecture 6 - Shape of a tree
- Lecture 7 - Metzgers theory
- Lecture 8 - Form factor and form quotients
- Lecture 9 - Taper equations
- Lecture 10 - Making the cuts
- Lecture 11 - Cross-section of a tree
- Lecture 12 - Where to measure the diameter
- Lecture 13 - Callipers - Usages and Issues
- Lecture 14 - Tape
- Lecture 15 - Measurement of bark and growth rings
- Lecture 16 - Tree height
- Lecture 17 - Method of similar triangles
- Lecture 18 - Distance measurements
- Lecture 19 - Angular measurement
- Lecture 20 - LIDAR
- Lecture 21 - Canopy attributes - Part I
- Lecture 22 - Canopy attributes - Part II
- Lecture 23 - Canopy attributes - Part III
- Lecture 24 - Canopy cover and closure
- Lecture 25 - Photogrammetry
- Lecture 26 - Basal area of a tree and stand
- Lecture 27 - Stand basal area, crop diameter and crop age
- Lecture 28 - Point sampling - I
- Lecture 29 - Point sampling - II

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

- Lecture 30 - Number density and sample calculations
- Lecture 31 - Volume
- Lecture 32 - The Quarter - girth formula
- Lecture 33 - Volume computations in the field
- Lecture 34 - Volume Table
- Lecture 35 - Forest Sampling
- Lecture 36 - Density and mass measurement
- Lecture 37 - Normalized difference vegetation Index (NDVI)
- Lecture 38 - Site quality
- Lecture 39 - Recap - I
- Lecture 40 - Recap - II

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

NPTEL Video Course - Biotechnology - NOC:Introduction to Professional and Scientific Communication

Subject Co-ordinator - Mr. S. Ganesh

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction to the topic

Lecture 2 - Where do research ideas come from?

Lecture 3 - Inductive vs Deductive Reasoning

Lecture 4 - Scientific Hypothesis

Lecture 5 - Scientific Hypothesis (Continued...)

Lecture 6 - Testing the Hypothesis

Lecture 7 - Introduction to Scientific Writing

Lecture 8 - Writing an Abstract

Lecture 9 - Title for a Research Paper

Lecture 10 - Title and Keywords

Lecture 11 - Mileposts for the Article Writing

Lecture 12 - Writing the Methods Section

Lecture 13 - Writing the Results Section

Lecture 14 - Writing Results Section (Continued...)

Lecture 15 - How to Prepare Figures

Lecture 16 - How to Prepare Schematics

Lecture 17 - How to write Introduction and Discussion Sections

Lecture 18 - Finalizing the Manuscript and Ethics in Research

Lecture 19 - Writing a Research Proposal and Preparing for a Presentation

Lecture 20 - Tutorial Session

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

NPTEL Video Course - Biotechnology - NOC:Bioelectrochemistry

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Basic Concepts - I

Lecture 2 - Basic Concepts - II

Lecture 3 - Key Terms

Lecture 4 - Galvanic Cells - I

Lecture 5 - Galvanic Cells - II

Lecture 6 - Salt Bridge

Lecture 7 - Standard Potentials - I

Lecture 8 - Standard Potentials - II

Lecture 9 - Standard Potentials - III

Lecture 10 - Nernst Equation

Lecture 11 - Relationship between Standard electrode potential (E°) and Equilibrium constant (K)

Lecture 12 - Cell as chemical probe and Biochemist's formal potential

Lecture 13 - Concept of Concentration Cell - I

Lecture 14 - Concept of Concentration Cell - II

Lecture 15 - Bio-electrochemistry of excitable cells (nerve cells)

Lecture 16 - Types of electrodes

Lecture 17 - Critical care profile and metal electrode

Lecture 18 - pH measurement

Lecture 19 - Redox indicators amperometry

Lecture 20 - Redox proteins, Metalloproteins and Cyclic Voltammetry

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

NPTEL Video Course - Biotechnology - NOC:Bioenergetics of Life Processes

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Bioenergetics of Life Processes
- Lecture 2 - Bioenergetics
- Lecture 3 - Iron-Sulfur world
- Lecture 4 - Evolution of complex cellular membranes
- Lecture 5 - Charge transfer across membrane
- Lecture 6 - Biological order and energy - I
- Lecture 7 - Biological order and energy - II
- Lecture 8 - Biological order and energy - III
- Lecture 9 - Summary of thermodynamical parameters - I
- Lecture 10 - Summary of thermodynamical parameters - II
- Lecture 11 - Photosynthesis - I
- Lecture 12 - Photosynthesis - II
- Lecture 13 - Photosynthesis - III
- Lecture 14 - Photosynthesis - IV
- Lecture 15 - Photosynthesis - V
- Lecture 16 - Photosynthesis - VI
- Lecture 17 - Photosynthesis - VII
- Lecture 18 - Photosynthesis - VIII
- Lecture 19 - ATP Synthesis
- Lecture 20 - Mitochondria and Chemiosmotic hypothesis

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

NPTEL Video Course - Biotechnology - NOC:WildLife Conservation

Subject Co-ordinator - Dr. Ankur Awadhiya

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Preliminaries
- Lecture 2 - A closer look at Biodiversity
- Lecture 3 - Economics Valuation of Biodiversity
- Lecture 4 - Threats to Biodiversity
- Lecture 5 - Preliminaries
- Lecture 6 - Basics of Sampling
- Lecture 7 - Distance Sampling - I
- Lecture 8 - Distance Sampling - II
- Lecture 9 - Radio-telemetry
- Lecture 10 - Behavioural monitoring
- Lecture 11 - What is a habitat
- Lecture 12 - Habitat degradation, loss, fragmentation and displacement
- Lecture 13 - Reserve selection and design
- Lecture 14 - Habitat management and improvement
- Lecture 15 - Some terminologies
- Lecture 16 - Some common wildlife diseases
- Lecture 17 - Principles of disease management
- Lecture 18 - Preliminaries
- Lecture 19 - Mechanical capture
- Lecture 20 - Chemical capture
- Lecture 21 - Capture myopathy
- Lecture 22 - Care of immobilised animal
- Lecture 23 - Legal aspects of capture and restraint
- Lecture 24 - Other topics in capture and restraint
- Lecture 25 - Preliminaries and introduction to genetics
- Lecture 26 - Population genetics
- Lecture 27 - Chromosomal and genetic disorders, inbreeding
- Lecture 28 - Population viability analysis
- Lecture 29 - Reintroductions and outbreeding

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

- Lecture 30 - Fundamentals
- Lecture 31 - Zoos and their management
- Lecture 32 - Botanical gardens
- Lecture 33 - Other aspects
- Lecture 34 - Impacts of climate change
- Lecture 35 - Plastics and biodiversity
- Lecture 36 - Oil spills
- Lecture 37 - Crisis and learnings
- Lecture 38 - Revision - I
- Lecture 39 - Revision - II
- Lecture 40 - Revision - III

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

NPTEL Video Course - Biotechnology - NOC:Nanotechnology in Agriculture

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction
- Lecture 2 - What is Nanotechnology
- Lecture 3 - An outline
- Lecture 4 - Agriculture
- Lecture 5 - Modern Agriculture
- Lecture 6 - A Restart
- Lecture 7 - Classifying nanomaterials Based on Shape and Geometry
- Lecture 8 - Classifying Nanomaterials Based on Chemical Nature
- Lecture 9 - Physical Approaches to Nanomaterial Synthesis
- Lecture 10 - Biological and Chemical Approaches to Nanomaterial Synthesis
- Lecture 11 - Detailed Physical Techniques - I
- Lecture 12 - Detailed Physical Techniques - II
- Lecture 13 - Detailed Chemical Techniques
- Lecture 14 - Detailed Biological Techniques
- Lecture 15 - Basic Characterisation Techniques of Nanomaterials
- Lecture 16 - Characterisation techniques for physical and chemical surface properties of a material
- Lecture 17 - Nanomaterials in Agriculture
- Lecture 18 - Iron pyrite and seed pre-treatment
- Lecture 19 - nano-Pyrite and its lab trial with chickpea
- Lecture 20 - nano-Pyrite field trial with spinach and its mechanistic details
- Lecture 21 - Mechanistic details of the action of Pyrite nano-particle
- Lecture 22 - Application of Pyrite nano-particle in different crops
- Lecture 23 - Application of different nano-particles in Agriculture - I
- Lecture 24 - Benefits of nanoparticles in Agriculture
- Lecture 25 - Nanotechnology in animal production
- Lecture 26 - Antioxidant nanomaterial in animal production - I
- Lecture 27 - Antioxidant nanomaterial in animal production - II
- Lecture 28 - Antioxidant nanomaterial in animal production - III
- Lecture 29 - Antioxidant nanomaterial in skeletal muscle development - I

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

- Lecture 30 - Antioxidant nanomaterial in skeletal muscle development - II
- Lecture 31 - Skeletal muscle development and nanomaterial intervention
- Lecture 32 - Fabrication of nano-micro devices to study force generation in muscles
- Lecture 33 - Summarising role of nanomaterials in animal production
- Lecture 34 - Nanomaterials in food processing and preservation - I
- Lecture 35 - Nanomaterials in food processing and preservation - II
- Lecture 36 - Multifunctionality of nanomaterial
- Lecture 37 - Futuristic multifunctional, sustainable and green nanomaterial
- Lecture 38 - Case study of Titanium dioxide - I
- Lecture 39 - Case study of Titanium dioxide - II
- Lecture 40 - The future

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

NPTEL Video Course - Biotechnology - NOC:Wild Life Ecology

Subject Co-ordinator - Dr. Ankur Awadhiya, Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to the course
- Lecture 2 - A historical overview of Ecology
- Lecture 3 - Ecology and Evolution
- Lecture 4 - The levels of organisation
- Lecture 5 - Species abundance and composition
- Lecture 6 - Biodiversity - II
- Lecture 7 - Positive Interactions
- Lecture 8 - Negative Interactions
- Lecture 9 - Study of Behaviour and Behavioral Ecology
- Lecture 10 - Food chains, Food webs and trophic levels
- Lecture 11 - Primary Production
- Lecture 12 - Nutrient Cycles
- Lecture 13 - Population parameters and demographic techniques
- Lecture 14 - Population growth and regulation
- Lecture 15 - Population studies and applications
- Lecture 16 - Community nature and parameters
- Lecture 17 - Community changes and ecological succession
- Lecture 18 - Community organisation
- Lecture 19 - Biogeography
- Lecture 20 - Why are things where they are?
- Lecture 21 - Some push and pull factors in greater detail
- Lecture 22 - Threats to species
- Lecture 23 - In-situ conservation
- Lecture 24 - Ex-situ conservation
- Lecture 25 - Introduction and impacts
- Lecture 26 - Human population growth and food requirements
- Lecture 27 - Sustainable development
- Lecture 28 - Oil spills
- Lecture 29 - Plastic and biodiversity

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

- Lecture 30 - Impacts of climate change
- Lecture 31 - Optimum yield problem
- Lecture 32 - Biological control
- Lecture 33 - Ecotoxicology and pollution management, Restoration ecology
- Lecture 34 - Revision
- Lecture 35 - Revision
- Lecture 36 - Revision

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

NPTEL Video Course - Biotechnology - NOC:Forests and their Management

Subject Co-ordinator - Dr. Ankur Awadhiya

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - What is a forest ?
- Lecture 2 - Classification of forests
- Lecture 3 - Value of forests
- Lecture 4 - What is Silviculture ?
- Lecture 5 - Plant Growth Factors
- Lecture 6 - Ecological Succession
- Lecture 7 - Soil and Soil Profile
- Lecture 8 - Major Soil Types
- Lecture 9 - Nutrient Cycles
- Lecture 10 - Tree Form
- Lecture 11 - Measurement of Tree attributes - I
- Lecture 12 - Measurement of Tree attributes - II
- Lecture 13 - Classical Tools
- Lecture 14 - Photogrammetry
- Lecture 15 - LiDAR
- Lecture 16 - Kinds of Threats
- Lecture 17 - Forest Fire
- Lecture 18 - Forest Law
- Lecture 19 - Regeneration
- Lecture 20 - Silvicultueal Systems
- Lecture 21 - Clear Felling System
- Lecture 22 - Shelterwood System - I
- Lecture 23 - Shelterwood System - II
- Lecture 24 - Selection System and Irregular Shelterwood System
- Lecture 25 - Logging and Processing
- Lecture 26 - Growing Stock and Increment
- Lecture 27 - Yield and Sustained Yield
- Lecture 28 - Seed Collection and Treatment
- Lecture 29 - Nursery Techniques

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

- Lecture 30 - Planting and Tending
- Lecture 31 - NTFP
- Lecture 32 - Social Forestry and Tribal Welfare
- Lecture 33 - Conservation of Wild Animals
- Lecture 34 - Revision - Part 1
- Lecture 35 - Revision - Part 2
- Lecture 36 - Revision - Part 3

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

NPTEL Video Course - Biotechnology - NOC:Conservation Economics

Subject Co-ordinator - Dr. Ankur Awadhiya

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to the Course, Making Decisions - I
- Lecture 2 - Making Decisions - II and Interactions - I
- Lecture 3 - Intecractions-II and Working of the Economy
- Lecture 4 - Conservation in the Anthropocene
- Lecture 5 - Human population growth and food requirements
- Lecture 6 - Unsustainable development
- Lecture 7 - Climate change
- Lecture 8 - Plastics
- Lecture 9 - Oil spills and mining
- Lecture 10 - Push and pull factors: Localisation of species
- Lecture 11 - Threats to species
- Lecture 12 - Developmental Hazards and Ecotoxicology
- Lecture 13 - Need to understand controls
- Lecture 14 - Thinking as an Economist
- Lecture 15 - Interdependence and gains from trade
- Lecture 16 - Demand and supply
- Lecture 17 - Elasticity
- Lecture 18 - Government policy
- Lecture 19 - Surplus and market efficiency
- Lecture 20 - Market Efficiency and Cost of Taxation
- Lecture 21 - International Trade
- Lecture 22 - Externalities
- Lecture 23 - Public goods and common resources
- Lecture 24 - The design of the tax system
- Lecture 25 - The Costs of Production
- Lecture 26 - Competition
- Lecture 27 - Monopoly
- Lecture 28 - Markets for factors of production
- Lecture 29 - Earnings and discrimination

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

- Lecture 30 - Income inequality and poverty
- Lecture 31 - Consumer choice
- Lecture 32 - Asymmetric information, Politics and Behavioural Economics
- Lecture 33 - Valuation of natural resources
- Lecture 34 - Economics of Protected Areas
- Lecture 35 - Economics of Environmental Disasters - 1
- Lecture 36 - Economics of Environmental Disasters - 2

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

NPTEL Video Course - Biotechnology - NOC:Conservation Geography

Subject Co-ordinator - Dr. Ankur Awadhiya

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - The need for conservation
- Lecture 2 - Geography and conservation
- Lecture 3 - Biogeography
- Lecture 4 - Origin and evolution of the earth
- Lecture 5 - Structure of the earth
- Lecture 6 - Features of the earth
- Lecture 7 - Rocks and minerals
- Lecture 8 - Geomorphology and processes
- Lecture 9 - Evolution of landforms
- Lecture 10 - Structure and composition
- Lecture 11 - Atmospheric circulation and weather
- Lecture 12 - Climate and climate change
- Lecture 13 - Structure and composition
- Lecture 14 - Oceans and water movement
- Lecture 15 - Hydrological cycle
- Lecture 16 - Structure and physiography of India
- Lecture 17 - Climate and habitats of India
- Lecture 18 - Drainage systems
- Lecture 19 - Soil
- Lecture 20 - Life on Earth
- Lecture 21 - Biodiversity
- Lecture 22 - Threats to species
- Lecture 23 - Ex-situ and in-situ conservation
- Lecture 24 - Benefits from conservation
- Lecture 25 - Population and population growth - I
- Lecture 26 - Population and population growth - II
- Lecture 27 - Human development and sustainable development
- Lecture 28 - Resources and Conservation
- Lecture 29 - Water Resources

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

- Lecture 30 - Mineral and Energy Resources
- Lecture 31 - Economic Geography and Conservation
- Lecture 32 - Trade
- Lecture 33 - Settlements
- Lecture 34 - Special Topics in Geography and Conservation
- Lecture 35 - Disasters
- Lecture 36 - Valuation of Natural Resources

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

NPTEL Video Course - Biotechnology - NOC:Neurobiology

Subject Co-ordinator - Prof. Nitin Gupta

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - L1 Module 1
Lecture 2 - L1 Module 2
Lecture 3 - L1 Module 3
Lecture 4 - L1 Module 4
Lecture 5 - L1 Module 5
Lecture 6 - L1 Module 6
Lecture 7 - L1 Module 7
Lecture 8 - L1 Module 8
Lecture 9 - L1 Module 9
Lecture 10 - L2 Module 1
Lecture 11 - L2 Module 2
Lecture 12 - L2 Module 3
Lecture 13 - L2 Module 4
Lecture 14 - L2 Module 5
Lecture 15 - L2 Module 6
Lecture 16 - L2 Module 7
Lecture 17 - L2 Module 8
Lecture 18 - L2 Module 9
Lecture 19 - L3 Module 1
Lecture 20 - L3 Module 2
Lecture 21 - L3 Module 3
Lecture 22 - L3 Module 4
Lecture 23 - L3 Module 5
Lecture 24 - L4 Module 1
Lecture 25 - L4 Module 2
Lecture 26 - L4 Module 3
Lecture 27 - L4 Module 4
Lecture 28 - L4 Module 5
Lecture 29 - L5 Module 1

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Lecture 30 - L5 Module 2
Lecture 31 - L5 Module 3
Lecture 32 - L5 Module 4
Lecture 33 - L5 Module 5
Lecture 34 - L5 Module 6

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

NPTEL Video Course - Biotechnology - NOC:Design for Biosecurity

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Biosecurity and Course Overview
- Lecture 2 - Allelopathic Interferences and Case Study
- Lecture 3 - U.N.W.H.I.M.A.A.I
- Lecture 4 - Livestock Biosecurity and its Preventive Measures
- Lecture 5 - Bioterrorist Agents and Modes of Attack
- Lecture 6 - History of Bioterrorism : Black Death
- Lecture 7 - Bioweapons Used in Warfare and Biological Weapon and Toxin Convention (BWC)
- Lecture 8 - Ebola and Marburg Virology in context to Biosensor Development
- Lecture 9 - Bacillus Anthrax Bacteriology in context to Biosensor Development
- Lecture 10 - Anthrax Types and Preventive Measures
- Lecture 11 - Unraveling the Ingenious Bacillus Anthracis Attack and Case Study for Anthrax Sensor
- Lecture 12 - Components for Designing Biosensors
- Lecture 13 - Principle of Quartz Crystal Microbalance (QCM)
- Lecture 14 - Sauerbrey Equation and QCM-D
- Lecture 15 - Principle, Setup and Applications of E-QCM-D
- Lecture 16 - Use of AFM Tool for Sensing - Part 1
- Lecture 17 - AFM for Bio-sensing - Part 2
- Lecture 18 - AFM and Recap Raman and IR Spectroscopy
- Lecture 19 - Applications of Raman
- Lecture 20 - AFM Cum Electrochemistry Workstation
- Lecture 21 - Monoclonal Antibody
- Lecture 22 - Monoclonal Antibody Production
- Lecture 23 - MAB Production Via Hybridomas
- Lecture 24 - Recognition Elements scFvs
- Lecture 25 - SPR : Surface Plasmon Resonance
- Lecture 26 - Design and Fabrication of Lateral-Flow Immunoassays
- Lecture 27 - Sandwich (Non-Competitive) Assays
- Lecture 28 - Botulism Toxin
- Lecture 29 - Botox Therapy

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- Lecture 30 - Developing Biosensor for Botulinum Toxin
- Lecture 31 - Story of Insulin
- Lecture 32 - Setting the Stage for the Discovery of Insulin
- Lecture 33 - Insulin Controversy
- Lecture 34 - Insulin Chemistry
- Lecture 35 - Insulin as Weapon of Murder
- Lecture 36 - Electrochemical Biosensors
- Lecture 37 - Electrode System in the Glucose Sensor
- Lecture 38 - World of Electrochemical Biosensors
- Lecture 39 - Glucose Sensor - Part 1
- Lecture 40 - Glucose Sensor - Part 2
- Lecture 41 - Non Enzymatic Glucose Sensor - Part 1
- Lecture 42 - Non Enzymatic Glucose Sensor - Part 2
- Lecture 43 - Summarizing Glucose Sensing - Part 1
- Lecture 44 - Summarizing Glucose Sensing - Part 2
- Lecture 45 - Summarizing Glucose Sensing - Part 3
- Lecture 46 - Far-Infrared Spectroscopy
- Lecture 47 - Metabolic Heat Conformation
- Lecture 48 - Electromagnetic Sensing
- Lecture 49 - World of Biohybrid Biosensors
- Lecture 50 - Whole Cell Biosensor
- Lecture 51 - Action Potential - Part 1
- Lecture 52 - Action Potential - Part 2
- Lecture 53 - Action Potential - Part 3
- Lecture 54 - Action Potential - Part 4
- Lecture 55 - Action Potential - Part 5
- Lecture 56 - Cell Based Biosensors - Part 1
- Lecture 57 - Cell Based Biosensors - Part 2
- Lecture 58 - Cell Based Biosensors - Part 3
- Lecture 59 - Cell Based Biosensors - Part 4
- Lecture 60 - Cell Based Biosensors - Part 5

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

NPTEL Video Course - Chemistry and Biochemistry - BioChemistry I

Subject Co-ordinator - Prof. S. Dasgupta

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Amino Acids - I
Lecture 2 - Amino Acids - II
Lecture 3 - Protein Structure - I
Lecture 4 - Protein structure - II
Lecture 5 - Protein Structure - III
Lecture 6 - Protein Structure - IV
Lecture 7 - Enzymes - I
Lecture 8 - Enzymes - II
Lecture 9 - Enzymes - III
Lecture 10 - Enzymes Mechanisms - I
Lecture 11 - Enzymes Mechanisms - II
Lecture 12 - Myoglobin and Hemoglobin
Lecture 13 - Lipids and Membranes - I
Lecture 14 - Lipids and Membranes - II
Lecture 15 - Membrane Transport
Lecture 16 - Carbohydrates - I
Lecture 17 - Carbohydrates - II
Lecture 18 - Vitamins and Coenzymes - I
Lecture 19 - Vitamins and Coenzymes - II
Lecture 20 - Nucleic Acids - I
Lecture 21 - Nucleic Acids - II
Lecture 22 - Nucleic Acids - III
Lecture 23 - Bioenergetics - I
Lecture 24 - Bioenergetics - II
Lecture 25 - Metabolism - I
Lecture 26 - Metabolism - II
Lecture 27 - Metabolism - III
Lecture 28 - Overview of the Course

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

NPTEL Video Course - Biotechnology - NOC:Industrial Biotechnology

Subject Co-ordinator - Prof. Debabrata Das

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Industrial Biotechnology

Lecture 2 - Development of industrial strain

Lecture 3 - Medium characteristics and biochemical pathways

Lecture 4 - Chemical reaction kinetics

Lecture 5 - Chemical reaction analysis (Continued...)

Lecture 6 - Different types of reactors

Lecture 7 - Reactor analysis

Lecture 8 - Reactor analysis (Continued...)

Lecture 9 - Stoichiometry of bioprocesses

Lecture 10 - Stoichiometry of bioprocesses (Continued...)

Lecture 11 - Enzymatic reaction Kinetics

Lecture 12 - Enzymatic reaction Kinetics (Continued...)

Lecture 13 - Immobilization techniques

Lecture 14 - Immobilization techniques (Continued...)

Lecture 15 - Life cycle of the microbial cell, Microbial growth kinetics, product formation and substrate degradation

Lecture 16 - Microbial growth kinetics, product formation and substrate degradation (Continued...)

Lecture 17 - Microbial growth kinetics, product formation and substrate degradation (Continued...)

Lecture 18 - Overview of the fermenter

Lecture 19 - Flow diagrams and pumps and valves used in fermentation industries

Lecture 20 - Flow diagrams and pumps and valves used in fermentation industries (Continued...)

Lecture 21 - Upstream processing

Lecture 22 - Upstream processing

Lecture 23 - Upstream processing

Lecture 24 - Downstream processing

Lecture 25 - Downstream processing

Lecture 26 - Downstream processing

Lecture 27 - Ethanol fermentation

Lecture 28 - Ethanol fermentation (Continued...)

Lecture 29 - Brewing industry

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- Lecture 30 - Brewing industry (Continued...)
- Lecture 31 - Wine industry
- Lecture 32 - Vinegar production
- Lecture 33 - Citric acid production
- Lecture 34 - Citric acid production (Continued...)
- Lecture 35 - Citric acid production (Continued...)
- Lecture 36 - Lactic acid production
- Lecture 37 - Lactic acid production (Continued...)
- Lecture 38 - Glutamic acid production
- Lecture 39 - Penicillin production
- Lecture 40 - Penicillin production (Continued...)
- Lecture 41 - Cephalosporin production
- Lecture 42 - Streptomycin production
- Lecture 43 - Baker's yeast fermentation
- Lecture 44 - Baker's yeast fermentation (Continued...)
- Lecture 45 - Fodder yeast production
- Lecture 46 - Spirulina production
- Lecture 47 - Alpha amylase production
- Lecture 48 - High fructose corn syrup production
- Lecture 49 - Metal leaching
- Lecture 50 - Cheese production
- Lecture 51 - Cheese production (Continued...)
- Lecture 52 - Biodiesel production
- Lecture 53 - Butanol production
- Lecture 54 - Biofertilizer
- Lecture 55 - Aerobic effluent treatment process
- Lecture 56 - Aerobic effluent treatment process (Continued...)
- Lecture 57 - Anaerobic effluent treatment process
- Lecture 58 - Anaerobic effluent treatment process
- Lecture 59 - 10 m³ Pilot Plant operation for Biohydrogen production
- Lecture 60 - Summary and conclusion

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

NPTEL Video Course - Biotechnology - NOC:Aspects Of Biochemical Engineering

Subject Co-ordinator - Prof. Debabrata Das

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction
Lecture 2 - Microbiology - I
Lecture 3 - Microbiology - II
Lecture 4 - Fundamentals of Biochemistry
Lecture 5 - Bioproducts and their market values
Lecture 6 - Stoichiometry of Biochemical Processes - I
Lecture 7 - Stoichiometry of Biochemical Processes - II
Lecture 8 - Stoichiometry of Biochemical Processes - III
Lecture 9 - Reaction Thermodynamics - I
Lecture 10 - Reaction Thermodynamics - II
Lecture 11 - Kinetics of homogeneous chemical reactions - I
Lecture 12 - Kinetics of homogeneous chemical reactions - II
Lecture 13 - Kinetics of homogeneous chemical reactions - III
Lecture 14 - Kinetics of homogeneous chemical reactions - IV
Lecture 15 - Kinetics of homogeneous chemical reactions - V
Lecture 16 - Different types of reactors
Lecture 17 - Reactor analysis - I
Lecture 18 - Reactor analysis - II
Lecture 19 - Reactor analysis - III
Lecture 20 - Reactor analysis - IV
Lecture 21 - Kinetics of enzyme catalyzed reactions using free enzymes - I
Lecture 22 - Kinetics of enzyme catalyzed reactions using free enzymes - II
Lecture 23 - Kinetics of enzyme catalyzed reactions using free enzymes - III
Lecture 24 - Kinetics of enzyme catalyzed reactions using free enzymes - IV
Lecture 25 - Kinetics of enzyme catalyzed reactions using free enzymes - V
Lecture 26 - Kinetics of enzyme catalyzed reactions using free enzymes - VI
Lecture 27 - Immobilization of Enzymes - I
Lecture 28 - Immobilization of Enzymes - II
Lecture 29 - Kinetics of enzyme catalyzed reactions using immobilized enzymes - I

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

- Lecture 30 - Kinetics of enzyme catalyzed reactions using immobilized enzymes - II
- Lecture 31 - Kinetics of substrate utilization, product formation and biomass production of microbial cells -
- Lecture 32 - Kinetics of substrate utilization, product formation and biomass production of microbial cells -
- Lecture 33 - Kinetics of substrate utilization, product formation and biomass production of microbial cells -
- Lecture 34 - Kinetics of substrate utilization, product formation and biomass production of microbial cells -
- Lecture 35 - Kinetics of substrate utilization, product formation and biomass production of microbial cells -
- Lecture 36 - Kinetics of substrate utilization, product formation and biomass production of microbial cells -
- Lecture 37 - Kinetics of substrate utilization, product formation and biomass production of microbial cells -
- Lecture 38 - Kinetics of substrate utilization, product formation and biomass production of microbial cells -
- Lecture 39 - Kinetics of substrate utilization, product formation and biomass production of microbial cells -
- Lecture 40 - Kinetics of substrate utilization, product formation and biomass production of microbial cells -
- Lecture 41 - Kinetics of substrate utilization, product formation and biomass production of microbial cells -
- Lecture 42 - Design and analysis of activated sludge process - I
- Lecture 43 - Design and analysis of activated sludge process - II
- Lecture 44 - Design and analysis of anaerobic digestion process
- Lecture 45 - Scale up of Bioreactor - I
- Lecture 46 - Scale up of Bioreactor - II
- Lecture 47 - Transport Phenomenon in Bioprocess - I
- Lecture 48 - Transport Phenomenon in Bioprocess - II
- Lecture 49 - Transport Phenomenon in Bioprocess - III
- Lecture 50 - Transport Phenomenon in Bioprocess - IV
- Lecture 51 - Air sterilization - I
- Lecture 52 - Air sterilization - II
- Lecture 53 - Medium sterilization - I
- Lecture 54 - Medium sterilization - II
- Lecture 55 - Operation of industrial fermenter and material analysis
- Lecture 56 - Process control of the biochemical processes
- Lecture 57 - Downstream processing - I
- Lecture 58 - Downstream processing - II
- Lecture 59 - Economic analysis of the biochemical processes
- Lecture 60 - Summary and Conclusion

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NPTEL Video Course - Biotechnology - NOC:Biomicrofluidics

Subject Co-ordinator - Prof. Tapas Kumar Maiti, Prof. Suman Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Biomicrofluidics
- Lecture 2 - Introduction to Biomicrofluidics (Continued...)
- Lecture 3 - Engineers' guide to the cell
- Lecture 4 - Fluidics in living systems and mechanobiology
- Lecture 5 - Pressure Driven Flows
- Lecture 6 - Surface tension driven flows
- Lecture 7 - Modulating surface tension
- Lecture 8 - Lab on a CD
- Lecture 9 - Introduction to Electrokinetics - Part I
- Lecture 10 - Introduction to Electrokinetics - Part II
- Lecture 11 - Microfluidic cell culture - Part I
- Lecture 12 - Microfluidic cell culture - Part II
- Lecture 13 - On-chip cellular assay techniques - Part I
- Lecture 14 - On-chip cellular assay techniques - Part II
- Lecture 15 - Microfluidics for understanding biology
- Lecture 16 - Organ-on-a-chip
- Lecture 17 - Lab-on-a-chip for genetic analysis
- Lecture 18 - Microfluidic technology for monoclonal antibody production
- Lecture 19 - Microfluidics for Healthcare
- Lecture 20 - Microfluidics for Healthcare

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NPTEL Video Course - Biotechnology - NOC:Immunology

Subject Co-ordinator - Prof. Agneyo Ganguly, Prof. S. K Ghosh

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Basic Concepts in Immunology
- Lecture 2 - Basic Concepts in Immunology (Continued...)
- Lecture 3 - Basic Concepts in Immunology (Continued...)
- Lecture 4 - Basic Concepts in Immunology (Continued...)
- Lecture 5 - Basic Concepts in Immunology (Continued...)
- Lecture 6 - Innate Immunity
- Lecture 7 - Inflammatory Response
- Lecture 8 - Adaptive Immunity
- Lecture 9 - Adaptive Immunity (Humoral)
- Lecture 10 - Effector Mechanisms
- Lecture 11 - Structure of antibody
- Lecture 12 - Structure of antibody and T-Cell Receptors
- Lecture 13 - Generation of diversity (GOD) of lymphocyte antigen receptors (Continued...)
- Lecture 14 - Generation of diversity (GOD) of lymphocyte antigen receptors (Continued...)
- Lecture 15 - Generation of diversity (GOD) of lymphocyte antigen receptors (Continued...)
- Lecture 16 - Generation of diversity (GOD) of lymphocyte antigen receptors (Continued...)
- Lecture 17 - Structural variation in immunoglobulin constant regions and isotype switching
- Lecture 18 - Structural variation in immunoglobulin constant regions and isotype switching (Continued...)
- Lecture 19 - Antigen recognition by T cell
- Lecture 20 - Antigen recognition by T cell
- Lecture 21 - Antigen Recognition by T cell
- Lecture 22 - Antigen Recognition by T cell
- Lecture 23 - The Generation of \hat{I}^{\pm}
- Lecture 24 - The Generation of \hat{I}^{\pm}
- Lecture 25 - Summary of Immune system
- Lecture 26 - Tools and Techniques
- Lecture 27 - Tools and Techniques (Continued...)
- Lecture 28 - Tools and Techniques (Continued...)
- Lecture 29 - Tools and Techniques (Continued...)

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- Lecture 30 - Flow Cytometry
- Lecture 31 - Development of T Lymphocytes
- Lecture 32 - Development of T Lymphocytes (Continued...)
- Lecture 33 - Development of T Lymphocytes (Continued...)
- Lecture 34 - T Cell Mediated Immunity
- Lecture 35 - T Cell Mediated Immunity (Continued...)
- Lecture 36 - B-Cell Maturation - I
- Lecture 37 - B-Cell Maturation - II
- Lecture 38 - B-Cell Activation
- Lecture 39 - B-Cell Activation and Differentiation
- Lecture 40 - Effector T - Cells
- Lecture 41 - Complement System Overview
- Lecture 42 - Complement System Overview (Continued...)
- Lecture 43 - Complement Biological Consequences
- Lecture 44 - Complement Biological Consequences (Continued...)
- Lecture 45 - Cytokines
- Lecture 46 - Cytokines
- Lecture 47 - Cytokines in Innate and Adaptive Immunity
- Lecture 48 - Interferons
- Lecture 49 - Hypersensitivity
- Lecture 50 - Hypersensitivity (Continued...)
- Lecture 51 - Autoimmunity
- Lecture 52 - Autoimmunity (Continued...)
- Lecture 53 - Autoimmunity (Continued...)
- Lecture 54 - Transplantation or Graft vs. Host Reaction
- Lecture 55 - Transplantation or Graft vs. Host Reaction (Continued...)
- Lecture 56 - Active and Passive Immunity and Vaccination
- Lecture 57 - Active and Passive Immunity and Vaccination (Continued...)
- Lecture 58 - Active and Passive Immunity and Vaccination (Continued...)
- Lecture 59 - Monoclonal Antibody
- Lecture 60 - Monoclonal Antibody (Continued...)

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

NPTEL Video Course - Biotechnology - NOC:Metabolic Engineering

Subject Co-ordinator - Prof. Amit Ghosh, Prof. Pinaki Sar

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Metabolic Engineering
- Lecture 2 - Essence of Metabolic Engineering - Part A
- Lecture 3 - Essence of Metabolic Engineering - Part B
- Lecture 4 - Essence of Metabolic Engineering - Part C
- Lecture 5 - Essence of Metabolic Engineering - Part D
- Lecture 6 - Review of Cellular Metabolism - Part A
- Lecture 7 - Review of Cellular Metabolism - Part B
- Lecture 8 - Review of Cellular Metabolism - Part C
- Lecture 9 - Review of Cellular Metabolism - Part D
- Lecture 10 - Review of Cellular Metabolism - Part E
- Lecture 11 - Review of Cellular Metabolism - Part F
- Lecture 12 - Introduction to Metabolic Networks
- Lecture 13 - Introduction to Systems Biology
- Lecture 14 - Regulatory Networks
- Lecture 15 - Reconstruction of Metabolic Networks
- Lecture 16 - The Stoichiometric Matrix: Representing Reconstructed Network Mathematically
- Lecture 17 - Flux Balance Analysis (FBA)
- Lecture 18 - Flux Variability Analysis (FVA) and Flux Coupling (FC)
- Lecture 19 - Dynamic Flux Balance Analysis (DFBA) and Gene Deletion Algorithms
- Lecture 20 - Optimization in MATLAB
- Lecture 21 - Robustness Analysis and Phenotypic Phase Planes
- Lecture 22 - Flux Sampling, Optknock and Optstrain
- Lecture 23 - Extreme Pathways and Elementary modes
- Lecture 24 - ^{13}C Metabolic Flux Analysis (^{13}C MFA)
- Lecture 25 - ^{13}C Metabolic Flux Analysis (^{13}C MFA)
- Lecture 26 - Advancement in ^{13}C Metabolic Flux Analysis
- Lecture 27 - E.coli core metabolic Network Optimization in MATLAB
- Lecture 28 - Application of Metabolic Flux Analysis
- Lecture 29 - CRISPR-Cas system and its application in metabolic engineering - Part I

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- Lecture 30 - CRISPR-Cas system and its application in metabolic engineering - Part II
- Lecture 31 - CRISPR-Cas system and its application in metabolic engineering - Part III
- Lecture 32 - CRISPR-Cas system and its application in metabolic engineering - Part IV
- Lecture 33 - Examples of pathway manipulations by metabolic engineering - Biofuels
- Lecture 34 - Metabolic engineering for biofuel production - Part A
- Lecture 35 - Metabolic engineering for biofuel production - Part B
- Lecture 36 - Metabolic engineering for biofuel production - Part C
- Lecture 37 - Applications of metabolic engineering in amino acids production

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

NPTEL Video Course - Biotechnology - NOC:Environmental Chemistry and Microbiology

Subject Co-ordinator - Prof. Sudha Goel, Prof. Anjali Pal

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Acids, Bases and Salts - Part I
Lecture 2 - Acids, Bases and Salts - Part II
Lecture 3 - Acids, Bases and Salts - Part III
Lecture 4 - Acids, Bases and Salts - Part IV
Lecture 5 - Acids, Bases and Salts - Part V
Lecture 6 - Chemical Equilibrium - I
Lecture 7 - Chemical Equilibrium - II
Lecture 8 - Chemical Equilibrium - III
Lecture 9 - Chemical Equilibrium - IV
Lecture 10 - Chemical Equilibrium - V
Lecture 11 - Chemical Kinetics - I
Lecture 12 - Chemical Kinetics - II
Lecture 13 - Chemical Kinetics - III
Lecture 14 - Chemical Kinetics - IV
Lecture 15 - Chemical Kinetics - V
Lecture 16 - Chemical Kinetics - Reaction Mechanism - Part A
Lecture 17 - Chemical Kinetics - Reaction Mechanism - Part B
Lecture 18 - Chemical Kinetics - Catalysis - Part A
Lecture 19 - Chemical Kinetics - Catalysis - Part B
Lecture 20 - Chemical Kinetics - Catalysis - Part C
Lecture 21 - Nitrogen chemistry - Part A
Lecture 22 - Nitrogen chemistry - Part B
Lecture 23 - Chlorine chemistry and disinfection - Part A
Lecture 24 - Chlorine chemistry and disinfection - Part B
Lecture 25 - Chlorine chemistry and disinfection - Part C
Lecture 26 - Radioactivity - Part A
Lecture 27 - Radioactivity - Part B
Lecture 28 - Radioactivity - Part C
Lecture 29 - Radioactivity - Part D

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- Lecture 30 - Radioactivity - Part E
- Lecture 31 - Introduction - I
- Lecture 32 - Introduction - II
- Lecture 33 - Overview of microbial life - I
- Lecture 34 - Overview of microbial life - II
- Lecture 35 - Overview of microbial life - III
- Lecture 36 - Cell chemistry - I
- Lecture 37 - Cell chemistry - II
- Lecture 38 - Cell Biology - I
- Lecture 39 - Cell Biology - II
- Lecture 40 - Cell Biology - III
- Lecture 41 - Cell Biology - IV
- Lecture 42 - Microscopy - I
- Lecture 43 - Microscopy - II
- Lecture 44 - Microbial Metabolism - I
- Lecture 45 - Microbial Metabolism - II
- Lecture 46 - Microbial Metabolism - III
- Lecture 47 - Xenobiotics - I
- Lecture 48 - Xenobiotics - II
- Lecture 49 - Microbial Growth - I
- Lecture 50 - Microbial Growth - II
- Lecture 51 - Microbial Growth - III
- Lecture 52 - Microbial Growth and Control - I
- Lecture 53 - Microbial Growth and Control - II
- Lecture 54 - Pathogens and diseases - I
- Lecture 55 - Pathogens and diseases - II
- Lecture 56 - Metabolic Diversity - I
- Lecture 57 - Metabolic Diversity - II
- Lecture 58 - Metabolic Diversity - III
- Lecture 59 - Metabolic Diversity - IV
- Lecture 60 - Metabolic Diversity - V
- Lecture 61 - Metabolic Diversity - VI
- Lecture 62 - Biogeochemical cycles - I
- Lecture 63 - Biogeochemical cycles - II

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

NPTEL Video Course - Biotechnology - NOC:Environmental Biotechnology

Subject Co-ordinator - Prof. Pinaki Sar

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction of Environmental Biotechnology, Scope and applications of the subject
- Lecture 2 - Introduction of Environmental Biotechnology, Scope and applications of the subject
- Lecture 3 - Ecosystem : Basic concepts of structure and function
- Lecture 4 - Ecosystem : Basic concepts of structure and function (Continued...)
- Lecture 5 - Microbial Ecology
- Lecture 6 - Microbial Ecology (Continued...)
- Lecture 7 - Microbial Ecosystems and Biogeochemical Cycling
- Lecture 8 - Biogeochemical Cycles
- Lecture 9 - Microbial ecology and environmental biotechnology - Part A
- Lecture 10 - Microbial ecology and environmental biotechnology - Part B
- Lecture 11 - Microbial ecology and environmental biotechnology - Part B (Continued...)
- Lecture 12 - Microbial ecology and environmental biotechnology - Part B (Continued...)
- Lecture 13 - Microbial ecology and environmental biotechnology - Part C
- Lecture 14 - Microbial ecology and environmental biotechnology - Part C (Continued...)
- Lecture 15 - Microbial ecology and environmental biotechnology - Part C (Continued...)
- Lecture 16 - Microbial Ecology and Environmental Biotechnology - Part C (Continued...)
- Lecture 17 - Microbiology of Environmental Engineering System
- Lecture 18 - Microbiology of Environmental Engineering System
- Lecture 19 - Microbiology of Environmental Engineering System
- Lecture 20 - Microbiology of Environmental Engineering System (Continued...)
- Lecture 21 - Physiological Ecology and Resource Exploitation by Microorganisms
- Lecture 22 - Physiological ecology and Resource Exploitation by Microorganisms (Continued...)
- Lecture 23 - Physiological ecology and Resource Exploitation by Microorganisms (Continued...)
- Lecture 24 - Physiological ecology and Resource Exploitation by Microorganisms (Continued...)
- Lecture 25 - Methods in Microbial Ecology with Relevance to Environmental Biotechnology
- Lecture 26 - Methods in Microbial Ecology with Relevance to Environmental Biotechnology (Continued...)
- Lecture 27 - Methods in Microbial Ecology with Relevance to Environmental Biotechnology (Continued...)
- Lecture 28 - Methods in Microbial Ecology with Relevance to Environmental Biotechnology (Continued...)
- Lecture 29 - Methods in Microbial Ecology with Relevance to Environmental Biotechnology (Continued...)

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- Lecture 30 - Methods in Microbial Ecology with Relevance to Environmental Biotechnology (Continued...)
- Lecture 31 - Methods in Microbial Ecology with Relevance to Environmental Biotechnology (Continued...)
- Lecture 32 - Methods in Microbial Ecology with Relevance to Environmental Biotechnology (Continued...)
- Lecture 33 - Methods in Microbial Ecology with Relevance to Environmental Biotechnology (Continued...)
- Lecture 34 - Methods in Microbial Ecology with Relevance to Environmental Biotechnology (Continued...)
- Lecture 35 - Bioremediation
- Lecture 36 - Bioremediation (Continued...)
- Lecture 37 - Bioremediation (Continued...)
- Lecture 38 - Bioremediation (Continued...)
- Lecture 39 - Biodegradation
- Lecture 40 - Biodegradation
- Lecture 41 - Biodegradation (Continued...)
- Lecture 42 - Microbial Interactions with Heavy Metals and Metalloids
- Lecture 43 - Microbial Interactions with Heavy Metals and Metalloids - Bioremediation
- Lecture 44 - Biohydrometallurgy
- Lecture 45 - Enhanced biological phosphorus removal process (EBPR)
- Lecture 46 - Biological nitrogen removal
- Lecture 47 - Microbially Enhanced Oil Recovery (MEOR)
- Lecture 48 - Emerging Pollutants
- Lecture 49 - Carbon capture, Carbon Sequestration and Utilization
- Lecture 50 - Bioenergy and Environmental Biotechnology
- Lecture 51 - Bioremediation case studies
- Lecture 52 - Bioremediation case studies (Continued...)

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

NPTEL Video Course - Biotechnology - NOC:Fundamentals of Protein Chemistry

Subject Co-ordinator - Prof. Swagata Dasgupta

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Amino Acids - I
Lecture 2 - Amino Acids - II
Lecture 3 - Amino Acids - III
Lecture 4 - The Peptide Bond
Lecture 5 - Discussion Class
Lecture 6 - Primary Structure
Lecture 7 - Secondary Structure
Lecture 8 - Tertiary and Quaternary Structure
Lecture 9 - Protein Interactions
Lecture 10 - Discussion Class
Lecture 11 - Protein folding and structure
Lecture 12 - Thermodynamics of Protein Folding
Lecture 13 - Protein Structure Methods
Lecture 14 - Protein Denaturation
Lecture 15 - Discussion Class
Lecture 16 - Protein Isolation Methods
Lecture 17 - Protein Purification
Lecture 18 - Biophysical Methods - I
Lecture 19 - Biophysical Methods - II
Lecture 20 - Biophysical Methods - III
Lecture 21 - Types of Protein ligand interactions
Lecture 22 - Kinetics and Thermodynamics of protein-ligand binding
Lecture 23 - Experimental methods in protein ligand interactions
Lecture 24 - Protein ligand docking
Lecture 25 - Discussion class
Lecture 26 - Enzymes I - Classification
Lecture 27 - Enzymes - II
Lecture 28 - Enzyme Mechanisms - I
Lecture 29 - Enzyme Mechanisms - II

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- Lecture 30 - Enzyme mechanisms - III
- Lecture 31 - Enzyme Kinetics - I
- Lecture 32 - Enzyme Kinetics - II
- Lecture 33 - Enzyme Inhibition - I
- Lecture 34 - Enzyme Inhibition - II
- Lecture 35 - Discussion class
- Lecture 36 - Motor Proteins - I
- Lecture 37 - Motor Proteins - II
- Lecture 38 - Metalloproteins - I
- Lecture 39 - Metalloproteins - II
- Lecture 40 - Myoglobin and Hemoglobin
- Lecture 41 - Membrane Proteins - I
- Lecture 42 - Membrane proteins - II
- Lecture 43 - Membrane Transport - I
- Lecture 44 - Membrane Transport - II
- Lecture 45 - Electron Transport Chain
- Lecture 46 - Protein Carbohydrate Interactions - I
- Lecture 47 - Protein Carbohydrate Interactions - II
- Lecture 48 - Protein Nucleic Acid Interactions - I
- Lecture 49 - Protein Nucleic Acid Interactions - II
- Lecture 50 - Protein Nucleic Acid Interactions - III
- Lecture 51 - Protein Protein Interactions - I
- Lecture 52 - Protein Protein Interactions - II
- Lecture 53 - Protein Peptide Interactions
- Lecture 54 - Chaperone proteins
- Lecture 55 - Protein Nanoparticle Interactions
- Lecture 56 - Oxidative stress in Proteins
- Lecture 57 - Enzyme action and Proteolytic cleavage
- Lecture 58 - Intrinsically disordered proteins
- Lecture 59 - Viral proteins
- Lecture 60 - Overview of Course

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

NPTEL Video Course - Biotechnology - NOC:Introduction to Biomedical Imaging Systems

Subject Co-ordinator - Dr. Arun K.Tangirala

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction - 1
Lecture 2 - Introduction - 2
Lecture 3 - Signals and Systems Overview
Lecture 4 - Important Signals
Lecture 5 - System
Lecture 6 - LSI Systems
Lecture 7 - Image Quality
Lecture 8 - Local Contrast
Lecture 9 - Blurring and Noise
Lecture 10 - Physics of Radiography
Lecture 11 - Types of Ionizing Radiations
Lecture 12 - EM Radiation
Lecture 13 - Attenuation Models
Lecture 14 - Radiation Dosimetry
Lecture 15 - PR_Instrument
Lecture 16 - PR_Instru_CA
Lecture 17 - PR_Image_formation
Lecture 18 - Imaging Equation_updated
Lecture 19 - Film screen_Optical Density
Lecture 20 - PR_Image Quality
Lecture 21 - CT_Intsru
Lecture 22 - CT_Instru_finish
Lecture 23 - CT Back projection
Lecture 24 - CT_BP_finish
Lecture 25 - Fan beam_IQ
Lecture 26 - CT_IQ_Artifact
Lecture 27 - Nuclear Med_Phys
Lecture 28 - Nuclear_Med_Radiotracers
Lecture 29 - Planar_Scintigraphy_Instru

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- Lecture 30 - Planar_Scintigraphy_Im and IQ
- Lecture 31 - Spect_Pet
- Lecture 32 - Ultrasound_Intro_Phys
- Lecture 33 - Ultrasound_Phys_Interactions
- Lecture 34 - US doppler and Instrumentation
- Lecture 35 - US_Beampattern
- Lecture 36 - Approximations
- Lecture 37 - US_Imaging Equation_modes
- Lecture 38 - Parameters of interest
- Lecture 39 - Beam Steering : Phased Array
- Lecture 40 - MRI_Intro_S1-S9
- Lecture 41 - MRI_Phys_S10-S16
- Lecture 42 - MRI_Phys_S17-S20
- Lecture 43 - MRI_Phys_S21-S28
- Lecture 44 - MRI_Phys_S29-S39
- Lecture 45 - MRI_Phys_S40-S44
- Lecture 46 - MRI_Phys_S45_S52
- Lecture 47 - MRI_Instru_S1_S16
- Lecture 48 - MRI_Instru_s17_s26
- Lecture 49 - MRI_slice sel_S27_S41
- Lecture 50 - MRI_Freq_Encode_S42_S60
- Lecture 51 - MRI_DAQ_S61_S69
- Lecture 52 - MRI_RECON_S70_S82
- Lecture 53 - MRI_IQ_S83_S96

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

NPTEL Video Course - Biotechnology - NOC:Next Generation Sequencing Technologies: Data Analysis and Applications

Subject Co-ordinator - Prof. Riddhiman Dhar

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction
Lecture 2 - Next Generation Sequencing Technologies - 454 Sequencing
Lecture 3 - Illumina Sequencing By Synthesis (SBS)
Lecture 4 - Single Molecule Real Time (SMRT) Sequencing
Lecture 5 - Ion Torrent and Nanopore Sequencing
Lecture 6 - Sequencing Coverage, Quality Score and Experiment Design
Lecture 7 - Data Formats
Lecture 8 - Data Formats (Continued...)
Lecture 9 - Data Quality
Lecture 10 - Data QC and Trimming
Lecture 11 - Hands-on: Setting up the system
Lecture 12 - Basic Shell Commands
Lecture 13 - Data Download and Exploration
Lecture 14 - Hands-on 1 - Data exploration and QC
Lecture 15 - Hands-on 1 - Data QC and Trimming
Lecture 16 - Read Mapping
Lecture 17 - Mapping Algorithms
Lecture 18 - Suffix tree-based mapping algorithm
Lecture 19 - Burrows-Wheeler Transform (BWT)
Lecture 20 - Read Mapping with BWT
Lecture 21 - Bowtie2 tool
Lecture 22 - Mapping reads with Bowtie2
Lecture 23 - Bowtie2 output
Lecture 24 - SAM and BAM format
Lecture 25 - SAM format: Alignment section
Lecture 26 - Variant Calling
Lecture 27 - Calling SNP/SNVs and Indels
Lecture 28 - Hands-on analysis : Variant Calling
Lecture 29 - VCF Files

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

- Lecture 30 - Variant Annotation
- Lecture 31 - Analysis of CNVs and SVs
- Lecture 32 - Introduction to RNA sequencing
- Lecture 33 - RNA-seq data processing pipeline
- Lecture 34 - Transcriptome Assembly and Quantification
- Lecture 35 - Transcript Abundance Quantification
- Lecture 36 - Biases in RNA-seq experiments
- Lecture 37 - Data Normalization Methods
- Lecture 38 - Data Normalization Methods (Continued...)
- Lecture 39 - Differential Gene Expression (DGE) Analysis
- Lecture 40 - DGE analysis results and visualizations
- Lecture 41 - Multiple hypothesis testing correction
- Lecture 42 - FDR correction and interpretation of DGE analysis results
- Lecture 43 - Functional Enrichment Analysis
- Lecture 44 - RNA-seq data analysis - Hands-on 2
- Lecture 45 - Hands-on 2: Setting up the system
- Lecture 46 - Hands-on 2: Preliminary Data Analysis
- Lecture 47 - Sample Specific Bias Correction
- Lecture 48 - Differential Gene Expression Analysis I
- Lecture 49 - DGE Analysis with spike-ins
- Lecture 50 - DGE Analysis Results and Functional Enrichment Analysis
- Lecture 51 - Genome Assembly
- Lecture 52 - Shortest Common Superstring (SCS) assembly
- Lecture 53 - Overlap-Layout-Consensus (OLC) approach
- Lecture 54 - de Bruijn Graph (DBG) based assembly
- Lecture 55 - Assembly and Quality Control
- Lecture 56 - Applications of NGS in Epigenomics
- Lecture 57 - Detecting DNA Methylations
- Lecture 58 - Genome-wide Transcription Factor(TF) Binding Sites
- Lecture 59 - Chromatin Accessibility
- Lecture 60 - Genome Organization in 3D

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

NPTEL Video Course - Biotechnology - NOC:Computational Neuroscience

Subject Co-ordinator - Prof. Sharba Bahdyopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Neuron Structure
- Lecture 2 - Networks of Neurons and Synapses
- Lecture 3 - Basic Structures in the Brain
- Lecture 4 - Systems of neural processing
- Lecture 5 - Methods of Recording Neural Activity
- Lecture 6 - Membrane Potential and All or None Spike
- Lecture 7 - Patch Clamp Measurements
- Lecture 8 - Ion channels
- Lecture 9 - Current injection: Synapses
- Lecture 10 - Single Neuron Acitivity
- Lecture 11 - Point and compartmental models of neurons
- Lecture 12 - Hodgkin Huxley Equations - I
- Lecture 13 - Hodgkin Huxley Equations - II
- Lecture 14 - Reducing the HHE and Moris-Lecar Equations (MLE)
- Lecture 15 - Properties of MLE
- Lecture 16 - Phase Plane Analysis - I
- Lecture 17 - Phase Plane Analysis - II
- Lecture 18 - Phase Plane Analysis - III
- Lecture 19 - Analysing HHE with Phase Plane Analysis - I
- Lecture 20 - Analysing HHE with Phase Plane Analysis - II
- Lecture 21 - Random variables and random process
- Lecture 22 - Spike train statistics and response measure
- Lecture 23 - Receptive fields and models of receptive fields
- Lecture 24 - Stimulus to Response mapping (Coding) - I
- Lecture 25 - Stimulus to Response mapping (Coding) - II
- Lecture 26 - Stimulus to Response Mapping (Coding) - III
- Lecture 27 - Response to Stimulus Mapping (Decoding)
- Lecture 28 - Basics of Information Theory - I
- Lecture 29 - Basics of Information Theory - II

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

- Lecture 30 - Maximally Informative Dimensions
- Lecture 31 - Intro to Discrimination based methods
- Lecture 32 - Kullback Leibler Distance
- Lecture 33 - Measuring Spike Train Distances - I
- Lecture 34 - Measuring Spike Train Distances - II
- Lecture 35 - Signal and Noise Correlations
- Lecture 36 - Statistical Methods in Discrimination
- Lecture 37 - Single Cell Decoding - I: Two Alternative Forced Choice task in Monkeys
- Lecture 38 - Single Cell Decoding - II: Using ROC Curves for discrimination
- Lecture 39 - Single Cell Encoding - I: Operant Conditioning Task in Ferrets
- Lecture 40 - Single Cell Encoding - II: Learning in avoidance and approach methods in Ferrets
- Lecture 41 - Plasticity - Synaptic Transmission and Synaptic Strength
- Lecture 42 - Ways of modification of Synaptic Strength
- Lecture 43 - Type of Plasticity
- Lecture 44 - Short Term Plasticity - I
- Lecture 45 - Short Term Plasticity - II
- Lecture 46 - Long Term Plasticity
- Lecture 47 - Spike Time Dependent Plasticity
- Lecture 48 - Hebbian Plasticity
- Lecture 49 - BCM Rule
- Lecture 50 - Synaptic Normalization
- Lecture 51 - Adaptation
- Lecture 52 - Models of Short Term Plasticity
- Lecture 53 - Attention - I
- Lecture 54 - Attention - II
- Lecture 55 - Developmental Cicuits
- Lecture 56 - Optimal Coding in Visual System
- Lecture 57 - Optimal Coding in Auditory System
- Lecture 58 - Optimal Coding of Deviant Stimuli in Development
- Lecture 59 - Spike Timing Dependent Plasticity - a theoretical Perspective
- Lecture 60 - Important Problems in Neuroscience

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

NPTEL Video Course - Biotechnology - NOC:Electrophysiology of Heart

Subject Co-ordinator - Dr. Arijita Banerjee

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Ionic basis of membrane potential

Lecture 2 - Physiology of voltage gated channels

Lecture 3 - Physiology of voltage gated channels

Lecture 4 - Cardiac muscle physiology

Lecture 5 - Action potential of cardiac muscle - 1

Lecture 6 - Action potential of cardiac muscle - 2

Lecture 7 - Conducting system of heart

Lecture 8 - ECG-Physiological basis

Lecture 9 - ECG-Normal, Technical aspects

Lecture 10 - ECG Interpretation

Lecture 11 - Abnormal ECG - 1

Lecture 12 - Abnormal ECG - 2

Lecture 13 - ECG and Myocardial Infarction

Lecture 14 - Heart rate and Blood pressure - Baroreflex pathway

Lecture 15 - ECG and Hypertension

Lecture 16 - Autonomic regulation of heart

Lecture 17 - Heart rate variability (HRV)

Lecture 18 - Heart rate variability-interpretation and clinical uses, Blood pressure variability

Lecture 19 - Autonomic Function Tests - 1

Lecture 20 - Autonomic Function Tests - 2

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

NPTEL Video Course - Biotechnology - NOC:Pharmacognosy and Metabolic Engineering

Subject Co-ordinator - Prof. Adinpunya Mitra

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Pharmacognosy and Medicinal Plants
- Lecture 2 - Plant Specialized Metabolites: Waste Products or Ecochemicals?
- Lecture 3 - Evolution of Specialized Metabolism from Primary Metabolism
- Lecture 4 - Production of specialized metabolites through cell and organ culture
- Lecture 5 - Eliciting specialized metabolism in culture
- Lecture 6 - Analysis of Specialized Metabolites - Tools and Techniques
- Lecture 7 - Metabolic phytochemistry-based approaches for studying plant specialized metabolism
- Lecture 8 - Metabolic engineering strategies in plants
- Lecture 9 - Plant genetic transformation (through natural genetic engineer)
- Lecture 10 - Design of vectors for Agrobacterium-mediated gene transfer; Transformed and co-
- Lecture 11 - Introduction to alkaloids
- Lecture 12 - Biosynthesis of tropane alkaloids
- Lecture 13 - Engineering tropane alkaloid pathways in plants - I
- Lecture 14 - Engineering tropane alkaloid pathways in plants - II : Engineering tropane alkaloid pathway
- Lecture 15 - Isoquinoline alkaloids - Biosynthesis and tissue localization
- Lecture 16 - Isoquinoline alkaloids - Late steps of biosynthetic pathway and tissue localization
- Lecture 17 - Benzyloisoquinoline alkaloids - Induced top1 mutant and natural T mutantEngineering
- Lecture 18 - Benzyloisoquinoline alkaloids - Metabolic pathway engineering
- Lecture 19 - RNAi-mediated replacement of morphine with nornarcotic alkaloid reticuline in opium
- Lecture 20 - Isoquinoline alkaloids - biosynthesis and tissue localization
- Lecture 21 - Indole alkaloids - Early steps of biosynthesis
- Lecture 22 - Indole alkaloids - Metabolic engineering of early steps of indole alkaloid pathway
- Lecture 23 - Indole alkaloids - Environmental factors regulating indole alkaloid biosynthesis
- Lecture 24 - Indole alkaloids - Role of elicitors in modulating alkaloids accumulation
- Lecture 25 - Indole alkaloids - Late steps of indole alkaloid biosynthesis
- Lecture 26 - Indole alkaloids - Regulatory roles of transcription factors in light-induced
- Lecture 27 - Engineering indole alkaloid pathways in Catharanthus roseus hairy root cultures
- Lecture 28 - Missing enzymes of vindoline biosynthetic pathway
- Lecture 29 - Monoterpene indole alkaloid pathway cell and tissue localization

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- Lecture 30 - Model for biosynthesis and secretion of monoterpenoid indole alkaloids involving
- Lecture 31 - Metabolic reprogramming of periwinkle plant culture
- Lecture 32 - Engineered yeast brews precursors of anticancer drug vinblastine
- Lecture 33 - Recent discovery of strychnine biosynthetic pathway
- Lecture 34 - Indole alkaloid biosynthesis - a final overview
- Lecture 35 - Recent discovery of colchicine biosynthetic pathway
- Lecture 36 - Biosynthesis of terpenoids - an outline
- Lecture 37 - Diversity of monoterpenoids
- Lecture 38 - Biosynthesis of monoterpenoids
- Lecture 39 - Diversity of sesquiterpenes, diterpenes, triterpenes and polyterpenes
- Lecture 40 - Oleoresins and polyterpenes - an outline
- Lecture 41 - Monoterpenoids as components of floral scent volatiles: Metabolic engineering of
- Lecture 42 - Biosynthesis of carotenoids and carotenoid cleavage products
- Lecture 43 - Metabolic engineering of carotenoid pathway
- Lecture 44 - Metabolic engineering of carotenoid pathway: Golden Rice Story
- Lecture 45 - Menthol story: Biosynthesis and pathway manipulation - I
- Lecture 46 - Menthol story: Biosynthesis and pathway manipulation - II
- Lecture 47 - Artemisinin, hyperforin and taxol - three promising candidates for biotechnological
- Lecture 48 - Phenolics: Origin via shikimate pathway
- Lecture 49 - Phenolics: Phenylpropanoids, benzenoids, coumarins, tannins
- Lecture 50 - Phenolics: Monolignols, lignins and lignans
- Lecture 51 - Phenolics: Metabolic engineering of monolignol pathways
- Lecture 52 - Phenolics: Biosynthesis of lignans and podophyllotoxin; Caffeic acid esters
- Lecture 53 - Phenolics: Flavonoids, Flavones, Isoflavonoids, Proanthocyanidins
- Lecture 54 - Phenolics: Biosynthesis of anthocyanins; Metabolic pathway engineering for enhance
- Lecture 55 - Phenolics: Metabolic engineering of anthocyanin pathways in flowers
- Lecture 56 - Phenolics: Alcohol acetyl transferses and volatile phenolics
- Lecture 57 - Phenolics: Biosynthesis of volatile benzenoids
- Lecture 58 - Phenolics: Biosynthesis of vanillin in plants
- Lecture 59 - Phenolics: Metabolic engineering for vanillin
- Lecture 60 - Phenolics: Biosynthesis of shikonin
- Lecture 61 - Phenolics: Metabolic engineering of shikonin pathway
- Lecture 62 - Molecular Pharming: Transplastomic plants
- Lecture 63 - Molecular Pharming: production of human somatotropin in tobacco

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

NPTEL Video Course - Biotechnology - NOC:Introduction to Complex Biological Systems

Subject Co-ordinator - Prof. Soumya De, Prof. Dibyendu Samanta

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Fundamentals of a Living System
- Lecture 2 - Discovery of Genetic Material
- Lecture 3 - Chemical and Physical Properties of Nucleic Acids
- Lecture 4 - Introduction to DNA Replication
- Lecture 5 - Mechanistic Overview of DNA Replication
- Lecture 6 - Gene expression and The Central Dogma of Molecular Biology
- Lecture 7 - Transcription: Involved Machineries and Processes
- Lecture 8 - Translation: Decoding the message of an mRNA
- Lecture 9 - Time-space correlation and fidelity of transcription and translation
- Lecture 10 - Regulation of gene expression
- Lecture 11 - Amino acids, hierarchy of protein structure
- Lecture 12 - Protein folding, Folding funnel, Anfinsen's experiment
- Lecture 13 - Protein-ligand interactions
- Lecture 14 - Allosteric regulation of proteins, e.g. haemoglobin
- Lecture 15 - Membrane proteins
- Lecture 16 - Introduction to enzymes
- Lecture 17 - Theory of enzyme catalysis
- Lecture 18 - Specificity of enzymes, e.g. Chymotrypsin
- Lecture 19 - Enzyme inhibition. Types and mechanism of inhibitors. Design of inhibitors
- Lecture 20 - Engineered enzymes and their applications
- Lecture 21 - Introduction to cells
- Lecture 22 - Visualizing cells
- Lecture 23 - Cell division cycle
- Lecture 24 - Stem Cells
- Lecture 25 - Cancer
- Lecture 26 - Overview of the development of multicellular organization
- Lecture 27 - Pattern formation and growth
- Lecture 28 - Cell division, cell death and tissue homeostasis
- Lecture 29 - Cell Junctions and extracellular matrix

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

- Lecture 30 - Introduction to Neuron and the action potential
- Lecture 31 - Vitamins and introduction to bioenergetics
- Lecture 32 - Glycolysis, Gluconeogenesis and PPP
- Lecture 33 - Citric Acid Cycle and Oxidative Phosphorylation
- Lecture 34 - Photosynthesis
- Lecture 35 - Photosynthetic carbohydrate synthesis
- Lecture 36 - Evolution of life on earth
- Lecture 37 - Protein evolution
- Lecture 38 - Mechanisms of evolution
- Lecture 39 - Evolution of eye
- Lecture 40 - Model organisms
- Lecture 41 - Introduction to microbial world and infectious diseases
- Lecture 42 - Cell organization and unique features of bacteria
- Lecture 43 - Understanding viruses - The smallest enemy
- Lecture 44 - Pathogenicity and infection
- Lecture 45 - Antibacterial and Antiviral Drugs
- Lecture 46 - Introduction to the immune system
- Lecture 47 - Innate immunity: the first lines of defense
- Lecture 48 - Adaptive immune response
- Lecture 49 - Antibody - structure, function and diversity
- Lecture 50 - Vaccines and immunotherapy
- Lecture 51 - Visualizing and analyzing nucleic acids: Gel electrophoresis and PCR
- Lecture 52 - Visualizing and analyzing nucleic acids: DNA Sequencing
- Lecture 53 - Overview of genetic engineering and its impact on society
- Lecture 54 - Genetic engineering: Methods and applications
- Lecture 55 - Cloning and Gene manipulation
- Lecture 56 - Characterization methods
- Lecture 57 - Chromatographic methods
- Lecture 58 - Protein - ligand interactions
- Lecture 59 - Immunoassay techniques
- Lecture 60 - Landmark experiments in biology

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

NPTEL Video Course - Biotechnology - NOC:Biological Data Analysis and Visualization with R

Subject Co-ordinator - Prof. Riddhiman Dhar

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction
Lecture 2 - Setting up R
Lecture 3 - Basic functions in R
Lecture 4 - Basic data structures in R
Lecture 5 - Data structures and File I/O
Lecture 6 - Basic statistical tests with R
Lecture 7 - Correlation Analysis
Lecture 8 - Analysis of Variance (ANOVA)
Lecture 9 - Basic data visualization techniques
Lecture 10 - Data visualization
Lecture 11 - Visualization with vioplot and ggplot2
Lecture 12 - R packages for plotting and data organization
Lecture 13 - Data transformation in R
Lecture 14 - Bioconductor packages
Lecture 15 - Flow cytometry data analysis in R/Bioconductor
Lecture 16 - Gene expression analysis and co-expression network
Lecture 17 - WGCNA package and Data Download
Lecture 18 - WGCNA hands-on: Data preprocessing
Lecture 19 - WGCNA hands-on: Soft-threshold
Lecture 20 - WGCNA: Module gene expression
Lecture 21 - Introduction to ChIP-seq
Lecture 22 - ChIP-seq data analysis
Lecture 23 - ChIP-seq data analysis: Peak calling
Lecture 24 - Peak calling and Visualization
Lecture 25 - ChIP-seq data analysis: bigWig/bw files
Lecture 26 - Regression models on Biological data
Lecture 27 - Predictive models with linear regression
Lecture 28 - Multicollinearity
Lecture 29 - Lasso regression

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

- Lecture 30 - Non-linear regression
- Lecture 31 - Dimensionality reduction
- Lecture 32 - Principal Component Analysis (PCA)
- Lecture 33 - PCA analysis hands-on
- Lecture 34 - PCA analysis using `PCAtools`
- Lecture 35 - UMAP analysis
- Lecture 36 - Classification of biological samples
- Lecture 37 - Penalized and Stepwise Logistic regression
- Lecture 38 - Decision trees
- Lecture 39 - Classification and Regression trees
- Lecture 40 - Random Forests

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

NPTEL Video Course - Biotechnology - Downstream Processing

Subject Co-ordinator - Prof. Mukesh Doble

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction
- Lecture 2 - Mass balance, Heat Balance, flow sheet
- Lecture 3 - Costing
- Lecture 4 - Costing (continued), Physical and chemical principles in Down stream
- Lecture 5 - Problems in Mass balance, flow sheet
- Lecture 6 - Cell Breakage
- Lecture 7 - Cell breakage (Continued...)
- Lecture 8 - Solid Liquid Separation
- Lecture 9 - Solid Liquid Separation (Continued...)
- Lecture 10 - Solid Liquid separation-problems
- Lecture 11 - Pre-treatment and Filters
- Lecture 12 - Adsorption
- Lecture 13 - Adsorption
- Lecture 14 - Adsorption
- Lecture 15 - Adsorption
- Lecture 16 - Liquid-Liquid Extraction
- Lecture 17 - Liquid-Liquid Extraction
- Lecture 18 - Liquid-Liquid Extraction
- Lecture 19 - Liquid liquid extraction
- Lecture 20 - Reversed micellar and aqueous two phase extraction
- Lecture 21 - Membranes
- Lecture 22 - Membranes
- Lecture 23 - Membranes
- Lecture 24 - Membranes
- Lecture 25 - Precipitation
- Lecture 26 - Chromatography
- Lecture 27 - Chromatography
- Lecture 28 - Chromatography
- Lecture 29 - Chromatography

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

- Lecture 30 - Chromatography
- Lecture 31 - Chromatography
- Lecture 32 - Chromatography
- Lecture 33 - Crystallisation
- Lecture 34 - Drying
- Lecture 35 - Drying and distillation
- Lecture 36 - Future trends

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

NPTEL Video Course - Biotechnology - Thermodynamics

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

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction and Review

Lecture 2 - Need for Analysis Additional Thermodynamic Functions State and Path Variables

Lecture 3 - Equations for a Closed system Chemical Potential Concept Gibbs-Duhem Equation

Lecture 4 - Maxwell's relations

Lecture 5 - Inter-Relationships between Thermodynamic Variables

Lecture 6 - Some Useful Mathematical Manipulations

Lecture 7 - Thermodynamic Relations for a Closed System with 1 mole of a pure Substances

Lecture 8 - Maximum Work, Lost Work Review of Closed Systems

Lecture 9 - Open Systems

Lecture 10 - Equations of State - Virial Equations

Lecture 11 - Equations of State - Cubic Equations

Lecture 12 - Volume Estimation

Lecture 13 - Volume Estimation (Continued...) Generalized correlations

Lecture 14 - Generalized correlations (Continued...) Residual Properties

Lecture 15 - Residual Properties (Continued...)

Lecture 16 - Generalized Correlations and Residual Properties

Lecture 17 - Fugacity Coefficient Estimation

Lecture 18 - Review of Module 3

Lecture 19 - Learning Aspects Chemical Potential Formulations

Lecture 20 - Lewis and Randall rule partial Molar Properties

Lecture 21 - Partial Molar Property Estimation from Mixing Experiments

Lecture 22 - Partial Molar Property Estimation (Continued...) Excess Property

Lecture 23 - Activity Coefficient from Excess Property

Lecture 24 - Activity Coefficient from Excess Property (Continued...)

Lecture 25 - Activity Coefficient from Excess Property (Continued...) Models for Activity Coefficient in Binary

Lecture 26 - Models for Activity Coefficient in Binary Systems (Continued...)

Lecture 27 - Review of Module 4

Lecture 28 - Criteria for Phase Equilibrium Phase Rule for Non-reacting Biosystems

Lecture 29 - Clausius - Clayperon Equation

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- Lecture 30 - Clausius - Clayperon Equation (Continued...) vapour-Liquid Equilibrium
- Lecture 31 - Vapour-Liquid Equilibrium (Continued...) Estimation of Fugacity coefficient from Equilibrium P-V
- Lecture 32 - Liquid/Liquid and Solid/Liquid Equilibria
- Lecture 33 - Review of Module 5
- Lecture 34 - Criteria for Bio-reaction Equilibria
- Lecture 35 - Phase rule for Reacting Biosystems Equilibrium constants
- Lecture 36 - Effect of Temperature and Pressure on the Equilibrium constants
- Lecture 37 - Reaction in Liquid or Solid Phases
- Lecture 38 - Free energy Changes for some Bioreactions
- Lecture 39 - Electrolytes
- Lecture 40 - Course Review

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

NPTEL Video Course - Biotechnology - NOC:Principles of Downstream techniques in Bioprocess

Subject Co-ordinator - Prof. Mukesh Doble

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction
- Lecture 2 - Mass balance, Heat Balance, Flow sheet
- Lecture 3 - Costing
- Lecture 4 - Cell Breakage
- Lecture 5 - Solid Liquid Separation
- Lecture 6 - Pre-treatment and Filters/centrifuge
- Lecture 7 - Liquid-Liquid Extraction
- Lecture 8 - Liquid-Liquid extraction (Continued...)
- Lecture 9 - Adsorption
- Lecture 10 - Reversed micellar and aqueous two phase extraction
- Lecture 11 - Membranes
- Lecture 12 - Membranes (Continued...)
- Lecture 13 - Product stabilization, Drying, Lyophilisation
- Lecture 14 - Precipitation and crystallization
- Lecture 15 - Electrophoresis / SDS PAGE
- Lecture 16 - Chromatography
- Lecture 17 - Chromatography (Continued...1)
- Lecture 18 - Chromatography (Continued...2)
- Lecture 19 - Chromatography (Continued...3)
- Lecture 20 - Future trends, Other downstream operations/Summary of the course

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

NPTEL Video Course - Biotechnology - NOC:Biostatistics and Design of Experiments

Subject Co-ordinator - Prof. Mukesh Doble

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction

Lecture 2 - Experimental Design Strategy

Lecture 3 - Data types

Lecture 4 - Poisson Distribution

Lecture 5 - Normal Distribution

Lecture 6 - Standardized Normal Distribution / t-distribution

Lecture 7 - t-distribution/confidence interval

Lecture 8 - Statistical tests

Lecture 9 - t-Test

Lecture 10 - t-Tests

Lecture 11 - t-test

Lecture 12 - F-tests

Lecture 13 - F-tests

Lecture 14 - ANOVA

Lecture 15 - ANOVA

Lecture 16 - Anova

Lecture 17 - Anova

Lecture 18 - Anova

Lecture 19 - Anova

Lecture 20 - Anova

Lecture 21 - Normality test / Odds ratio

Lecture 22 - Chi square distribution

Lecture 23 - Chi square distribution / test

Lecture 24 - Chi square test

Lecture 25 - Chi square test and Weibull Distribution

Lecture 26 - Weibull Distribution

Lecture 27 - Weibull distribution.

Lecture 28 - Non-parametric test

Lecture 29 - Non parametric test/homogeneity of variance / beta distribution

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- Lecture 30 - Exponential / hypergeometric distributions
- Lecture 31 - Hypergeometric / Log normal distribution
- Lecture 32 - Design of experiments (DOE) - Introduction
- Lecture 33 - Factorial Design
- Lecture 34 - Full factorial design
- Lecture 35 - Fractional factorial design
- Lecture 36 - Other designs
- Lecture 37 - Second order designs
- Lecture 38 - Second order design
- Lecture 39 - Regression analysis
- Lecture 40 - Control charts

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

NPTEL Video Course - Biotechnology - NOC:Bioreactors

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 - Sterilization
Lecture 3 - Solution to PP 1.1
Lecture 4 - Some important concepts
Lecture 5 - Enzyme bioreactors, enzyme kinetics
Lecture 6 - Solution to PP 2.1
Lecture 7 - Inhibited enzyme kinetics
Lecture 8 - Solution to PP 2.2
Lecture 9 - Measurement principles and methods
Lecture 10 - Batch growth kinetics
Lecture 11 - Solution to PP 3.1
Lecture 12 - Bioreactor analysis
Lecture 13 - Solution to PP 3.2
Lecture 14 - Bioreactor environment parameters
Lecture 15 - Bioreactor env. par. (DO)
Lecture 16 - Solution to PP 4.1
Lecture 17 - Shear stress, scale-up, scale-down
Lecture 18 - Cell view
Lecture 19 - Solution to PP 5.1
Lecture 20 - Culture status, metabolic flux analysis
Lecture 21 - Course summary

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

NPTEL Video Course - Biotechnology - NOC:Medical Biomaterials

Subject Co-ordinator - Prof. Mukesh Doble

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to Biomaterials
- Lecture 2 - Background history
- Lecture 3 - History
- Lecture 4 - Properties - Mechanical and Physico-chemical
- Lecture 5 - Properties - Mechanical and Physico-chemical
- Lecture 6 - Mechanical properties
- Lecture 7 - Mechanical Properties (Continued...)
- Lecture 8 - Resorbability, biodegradation
- Lecture 9 - Resorbability, biodegradation (Continued...)
- Lecture 10 - Biofilm
- Lecture 11 - Biofilm (Continued...)
- Lecture 12 - Biofilm (Continued...)
- Lecture 13 - Biofilm (Continued...)
- Lecture 14 - Material characterization - Analytical instruments
- Lecture 15 - Analytical instruments
- Lecture 16 - Analytical instruments (Continued...)
- Lecture 17 - Analytical instruments (Continued...)
- Lecture 18 - Biological responses, compatibility, cytotoxicity
- Lecture 19 - Proteins, Tissue and blood Response
- Lecture 20 - Cell-biomaterial interaction
- Lecture 21 - Animal trials (in vivo)
- Lecture 22 - Animal trials
- Lecture 23 - Metals-types, classifications, applications
- Lecture 24 - Metals - properties
- Lecture 25 - Metals - properties (Continued...)
- Lecture 26 - Metals - properties (Continued...)
- Lecture 27 - Metals
- Lecture 28 - Polymers-types, classifications, applications
- Lecture 29 - Polymers

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

- Lecture 30 - Polymers (Continued...)
- Lecture 31 - Polymer blends
- Lecture 32 - Natural biopolymers
- Lecture 33 - Natural biopolymers - (Continued...)
- Lecture 34 - Biopolymers- proteins / hydrogels
- Lecture 35 - Hydrogels
- Lecture 36 - Experiments
- Lecture 37 - surface modification-Demonstration
- Lecture 38 - Ceramics
- Lecture 39 - Cardiovascular and ocular biomaterials
- Lecture 40 - Sterilisation/Device failure

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

NPTEL Video Course - Biotechnology - NOC:BioInformatics - Algorithms and Applications

Subject Co-ordinator - Prof. M. Michael Gromiha

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Concepts and importance of Bioinformatics
Lecture 2 - Complexities in biological systems
Lecture 3 - DNA sequence analysis
Lecture 4 - Sequence based parameters
Lecture 5 - Database
Lecture 6 - Database categories
Lecture 7 - Protein structure and function - I
Lecture 8 - Protein structure and function - II
Lecture 9 - Protein sequence databases - I
Lecture 10 - Protein sequence databases - II
Lecture 11 - Pairwise alignment - I
Lecture 12 - Pairwise alignment - II
Lecture 13 - Uniprot Demo
Lecture 14 - Sequence alignment - I
Lecture 15 - Sequence alignment - II
Lecture 16 - Sequence alignment
Lecture 17 - Sequence alignment
Lecture 18 - Conservation score - I
Lecture 19 - Conservation score - II
Lecture 20 - Blast Demo
Lecture 21 - Phylogenetic trees - I
Lecture 22 - Phylogenetic trees - II
Lecture 23 - Protein sequence analysis - I
Lecture 24 - Protein sequence analysis - II
Lecture 25 - Hydrophobicity profiles
Lecture 26 - Patterns and PSSM profiles
Lecture 27 - Construction of Non-redundant datasets - I
Lecture 28 - Non-redundant datasets - II
Lecture 29 - Protein secondary structure

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

- Lecture 30 - Secondary structure prediction - I
- Lecture 31 - Secondary structure prediction - II
- Lecture 32 - Secondary structure prediction - III
- Lecture 33 - Protein tertiary structure - I
- Lecture 34 - Protein tertiary structure - II
- Lecture 35 - Protein structure analysis - I
- Lecture 36 - Protein structure analysis - II
- Lecture 37 - Protein structure analysis - III
- Lecture 38 - Demo
- Lecture 39 - Protein structure analysis - IV
- Lecture 40 - Protein structure prediction - I
- Lecture 41 - Protein structure prediction - II
- Lecture 42 - Protein stability - I
- Lecture 43 - Protein stability - II
- Lecture 44 - Demo
- Lecture 45 - Stabilizing residues
- Lecture 46 - Thermodynamic database
- Lecture 47 - Stability of proteins upon mutations - I
- Lecture 48 - Stability of proteins upon mutations - II
- Lecture 49 - Demo
- Lecture 50 - Protein folding rate - I
- Lecture 51 - Protein folding rate - II
- Lecture 52 - Protein interactions - I
- Lecture 53 - Protein interactions - II
- Lecture 54 - Computer aided drug design - I
- Lecture 55 - Computer aided drug design - II
- Lecture 56 - Virtual screening - I
- Lecture 57 - Virtual screening - II
- Lecture 58 - QSAR - I
- Lecture 59 - QSAR - II
- Lecture 60 - Demo
- Lecture 61 - awk programming - I
- Lecture 62 - awk programming - II
- Lecture 63 - Development of algorithms - I
- Lecture 64 - Development of algorithms - II
- Lecture 65 - Applications of bioinformatics - I
- Lecture 66 - Applications of bioinformatics - II
- Lecture 67 - Overview - I
- Lecture 68 - Overview - II

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

Lecture 69 - Demo

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

NPTEL Video Course - Biotechnology - NOC:Demystifying the Brain

Subject Co-ordinator - Dr. V Srinivasa Chakravarthy

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - The Whole and Its Parts

Lecture 2 - Understanding Brain's Shape - Segment 1 - Brain size and intelligence

Lecture 3 - Understanding Brain's Shape - Segment 2 - Save Wire Principle

Lecture 4 - Understanding Brain's Shape - Segment 3 - Brain Evolution

Lecture 5 - Neurons and Neural Signaling

Lecture 6 - Neural Signalling

Lecture 7 - Networks that Learn - Segment 1

Lecture 8 - Multilayer Perceptrons Applications in Psychology and Neuroscience

Lecture 9 - Organization of the Central Nervous System-Segment 1 - Cortex

Lecture 10 - Organization of the Central Nervous System-Segment 2 - Subcortical Structures

Lecture 11 - Maps in the Brain - Segment 1

Lecture 12 - Maps in the Brain - Segment 2

Lecture 13 - Emotions in the Brain - Segment 1

Lecture 14 - Emotions in the Brain - Segment 2

Lecture 15 - Memories and Holograms - Segment 1

Lecture 16 - Memories and Holograms - Segment 2

Lecture 17 - Consciousness - Segment 1

Lecture 18 - Consciousness - Segment 2

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

NPTEL Video Course - Biotechnology - NOC:Computational Systems Biology

Subject Co-ordinator - Prof. Karthik Raman

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction
Lecture 2 - Introduction to Modelling
Lecture 3 - Introduction to Modelling
Lecture 4 - Fundamentals of Mathematical Modelling
Lecture 5 - Fundamentals of Mathematical Modelling
Lecture 6 - Fundamentals of Mathematical Modelling
Lecture 7 - Some Example Models
Lecture 8 - Representation of Biological Networks
Lecture 9 - Lab
Lecture 10 - Lab
Lecture 11 - Lab
Lecture 12 - Lab
Lecture 13 - Introduction to Networks
Lecture 14 - Introduction to Networks
Lecture 15 - Introduction to Network Biology
Lecture 16 - Introduction to Network Biology
Lecture 17 - Introduction to Network Biology
Lecture 18 - Network Biology
Lecture 19 - Network Models
Lecture 20 - Network Models
Lecture 21 - Biological Networks
Lecture 22 - Network Perturbations
Lecture 23 - Community Detection
Lecture 24 - Network Motifs
Lecture 25 - Lab
Lecture 26 - Lab
Lecture 27 - Lab
Lecture 28 - Network Biology
Lecture 29 - Lab

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

- Lecture 30 - Lab
- Lecture 31 - Reconstruction of Gene Regulatory Networks
- Lecture 32 - Reconstruction of Protein Networks
- Lecture 33 - Reconstruction of Signalling Networks
- Lecture 34 - Reconstruction of Signalling Networks
- Lecture 35 - Introduction to Dynamic Modelling
- Lecture 36 - Introduction to Dynamic Modelling
- Lecture 37 - Introduction to Dynamic Modelling
- Lecture 38 - Lab
- Lecture 39 - Lab
- Lecture 40 - Parameter Estimation
- Lecture 41 - Parameter Estimation
- Lecture 42 - Parameter Estimation
- Lecture 43 - Methods for Parameter Estimation
- Lecture 44 - Direct Search Methods
- Lecture 45 - Genetic Algorithms
- Lecture 46 - Genetic Algorithms
- Lecture 47 - Other Evolutionary Algorithms
- Lecture 48 - PyGMO
- Lecture 49 - Dynamic Modelling Recap
- Lecture 50 - Lab
- Lecture 51 - Guest Lecture
- Lecture 52 - Guest Lecture
- Lecture 53 - Guest Lecture
- Lecture 54 - Guest Lecture
- Lecture 55 - Guest Lecture
- Lecture 56 - Constraint-based Modelling of Metabolic Networks
- Lecture 57 - Flux Balance Analysis
- Lecture 58 - Flux Balance Analysis
- Lecture 59 - Flux Balance Analysis
- Lecture 60 - Other Constraint-Based Approaches
- Lecture 61 - Other Constraint-Based Approaches
- Lecture 62 - Lab
- Lecture 63 - Perturbations to Metabolic Networks
- Lecture 64 - Lab
- Lecture 65 - Understanding FBA
- Lecture 66 - Understanding FBA
- Lecture 67 - Perturbations to Metabolic Networks
- Lecture 68 - Perturbations to Metabolic Networks

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

- Lecture 69 - Perturbations to Metabolic Networks
- Lecture 70 - Constraint-based Modelling of Metabolic Networks
- Lecture 71 - Lab
- Lecture 72 - Integrating Regulatory Information into Constraint-Based Models
- Lecture 73 - Elementary Modes
- Lecture 74 - Elementary Modes
- Lecture 75 - Constraint-based Modelling of Metabolic Networks
- Lecture 76 - Constraint-based Modelling of Metabolic Networks
- Lecture 77 - Constraint-based Modelling of Metabolic Networks
- Lecture 78 - Lab
- Lecture 79 - Constraint-based Modelling of Metabolic Networks
- Lecture 80 - Constraint-based Modelling of Metabolic Networks
- Lecture 81 - Constraint-based Modelling of Metabolic Networks
- Lecture 82 - ^{13}C -Metabolic Flux Analysis using Mass Spectrometry
- Lecture 83 - ^{13}C -Metabolic Flux Analysis using Mass Spectrometry
- Lecture 84 - ^{13}C -Metabolic Flux Analysis using Mass Spectrometry
- Lecture 85 - Lab
- Lecture 86 - Modelling Gene Regulatory Networks
- Lecture 87 - Modelling Gene Regulatory Networks
- Lecture 88 - Modelling Gene Regulatory Networks
- Lecture 89 - Lab
- Lecture 90 - Lab
- Lecture 91 - Computational Modelling of Host-Pathogen Interactions
- Lecture 92 - Computational Modelling of Host-Pathogen Interactions
- Lecture 93 - Robustness in Biological Systems
- Lecture 94 - Robustness in Biological Systems
- Lecture 95 - Robustness in Biological Systems
- Lecture 96 - Robustness in Biological Systems
- Lecture 97 - Robustness and Evolvability
- Lecture 98 - Robustness and Evolvability
- Lecture 99 - Introduction to Synthetic Biology
- Lecture 100 - Advanced Topics
- Lecture 101 - Advanced Topics
- Lecture 102 - Advanced Topics
- Lecture 103 - Course Recap

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

NPTEL Video Course - Biotechnology - NOC:Material and Energy Balances

Subject Co-ordinator - Prof.Vignesh Muthuvijayan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Fundamentals of Engineering Calculations
Lecture 2 - Process Parameters and Variables
Lecture 3 - Fundamentals of Material Balances
Lecture 4 - Material Balance Calculations for Single Units Without Reactions - Part 1
Lecture 5 - Material Balance Calculations for Single Units Without Reactions - Part 2
Lecture 6 - Material Balance Calculations for Single Units Without Reactions - Part 3
Lecture 7 - Material Balance Calculations for Single Units Without Reactions - Part 4
Lecture 8 - Material Balance Calculations for Multiple Units Without Reactions - Part 1
Lecture 9 - Material Balance Calculations for Multiple Units Without Reactions - Part 2
Lecture 10 - Fundamentals of Reactive Processes
Lecture 11 - Material Balance Calculations For Single Units With A Single Reaction
Lecture 12 - Material Balance Calculations for Single Units with A Single Reaction (Continued...)
Lecture 13 - Material Balance Calculations for Single Units with Multiple Reactions - Part 1
Lecture 14 - Material Balance Calculations for Single Units with Multiple Reactions - Part 2
Lecture 15 - Material Balance Calculations for Single Units with Multiple Reactions - Part 3
Lecture 16 - Material Balance Calculations for Multiple Units with Reactions - Part 1
Lecture 17 - Material Balance Calculations for Multiple Units with Reactions - Part 2
Lecture 18 - Material Balances on Reactive Processes - Tutorials
Lecture 19 - Combustion Reactions
Lecture 20 - Material Balances for Combustion Reactions
Lecture 21 - Biochemical Reactions
Lecture 22 - Biochemical Reactions
Lecture 23 - Recycle Without Reactions
Lecture 24 - Recycle with Reactions
Lecture 25 - Recycle
Lecture 26 - Bypass
Lecture 27 - Purge
Lecture 28 - Material Balance
Lecture 29 - Material Balance

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

- Lecture 30 - Material Balance
- Lecture 31 - The Unreasonable Effectiveness of Material Balance
- Lecture 32 - Constraint-based modelling
- Lecture 33 - Flux balance analysis - Part 1
- Lecture 34 - Flux balance analysis - Part 2
- Lecture 35 - Energy Balance Terminologies and Concepts
- Lecture 36 - Introduction to Energy Balances - Part 1
- Lecture 37 - Introduction to Energy Balances - Part 2
- Lecture 38 - Introduction to Energy Balances
- Lecture 39 - Mechanical Energy Balances
- Lecture 40 - Mechanical Energy Balances
- Lecture 41 - Energy Balance Objectives and Procedures
- Lecture 42 - Introduction to Nonreactive Processes Without Phase Change
- Lecture 43 - Energy Balances on Single-Phase Nonreactive Processes
- Lecture 44 - Energy Balances on Single-Phase Nonreactive Processes
- Lecture 45 - Fundamentals of Nonreactive Phase Change Processes
- Lecture 46 - Estimating Latent Heats
- Lecture 47 - Energy Balances on Nonreactive Processes With Phase Change
- Lecture 48 - Energy Balances on Nonreactive Processes With Phase Change
- Lecture 49 - Energy Balances on Nonreactive Processes With Phase Change
- Lecture 50 - Psychrometric Charts
- Lecture 51 - Energy Balances Using Psychrometric Charts
- Lecture 52 - Mixing and Solution
- Lecture 53 - Mixing and Solution
- Lecture 54 - Mixing and Solution
- Lecture 55 - Fundamentals for Energy Balances on Reactive Processes - Part 1
- Lecture 56 - Fundamentals for Energy Balances on Reactive Processes - Part 1 and Part 2
- Lecture 57 - Fundamentals for Energy Balances on Reactive Processes - Tutorials
- Lecture 58 - Energy Balances on Reactive Processes - Part 1
- Lecture 59 - Energy Balances on Reactive Processes - Part 2
- Lecture 60 - Energy Balances on Reactive Processes - Part 3
- Lecture 61 - Energy Balances on Reactive Processes - Part 4
- Lecture 62 - Energy Balances on Reactive Processes - Part 5
- Lecture 63 - Energy Balances on Reactive Processes - Part 6
- Lecture 64 - Energy Balances
- Lecture 65 - Energy Balances
- Lecture 66 - Energy Balances
- Lecture 67 - Energy Balances
- Lecture 68 - Unsteady State Material Balances

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

Lecture 69 - Unsteady State Energy Balances

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

NPTEL Video Course - Biotechnology - NOC:Computer Aided Drug Design

Subject Co-ordinator - Prof. Mukesh Doble

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction
- Lecture 2 - Drug Discovery - Issues
- Lecture 3 - Target and Lead Identification
- Lecture 4 - Drug And Data bases
- Lecture 5 - Drug Properties
- Lecture 6 - Drug - Properties / SMILES
- Lecture 7 - Drug Solubility
- Lecture 8 - Drug Solubility / permeability
- Lecture 9 - ADME
- Lecture 10 - Drug - ADME
- Lecture 11 - Drug - ADME
- Lecture 12 - Drug - BBB
- Lecture 13 - Pgp efflux/Drug Likeness
- Lecture 14 - Drug Likeness
- Lecture 15 - Molecular Modelling
- Lecture 16 - Molecular Mechanics / Force Field
- Lecture 17 - Molecular Mechanics / Force Field
- Lecture 18 - Molecular Mechanics / Force Field
- Lecture 19 - Molecular Mechanics / Force Field
- Lecture 20 - ODES and Numerical methods
- Lecture 21 - ODES and Numerical methods
- Lecture 22 - Conformational Search / MD
- Lecture 23 - Quantum Mechanics
- Lecture 24 - Quantum Mechanics
- Lecture 25 - Quantitative Structure Activity Relationship (QSAR)
- Lecture 26 - Quantitative Structure Activity Relationship (QSAR)
- Lecture 27 - Quantitative Structure Activity Relationship (QSAR)
- Lecture 28 - Quantitative Structure Activity Relationship (QSAR)
- Lecture 29 - Quantitative Structure Activity Relationship (QSAR)

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- Lecture 30 - Quantitative Structure Activity Relationship (QSAR)
- Lecture 31 - 3D QSAR
- Lecture 32 - Pharmacophore modelling
- Lecture 33 - Target based drug design
- Lecture 34 - Target based drug design
- Lecture 35 - Target based drug design
- Lecture 36 - Target based drug design
- Lecture 37 - Docking
- Lecture 38 - Docking
- Lecture 39 - Pharmacokinetics / pharmacodynamics
- Lecture 40 - Pharmacokinetics / pharmacodynamics

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

NPTEL Video Course - Biotechnology - NOC:Plant Cell Bioprocessing

Subject Co-ordinator - Prof. Smita Srivastava

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to plant cell technology
- Lecture 2 - History of plant cell and tissue culture
- Lecture 3 - Anatomy of plant cells
- Lecture 4 - Plant tissues and functions
- Lecture 5 - Photosynthesis and Photorespiration
- Lecture 6 - In-vitro culture initiation
- Lecture 7 - Nutritional requirements of plant cells
- Lecture 8 - Organogenesis and Regeneration
- Lecture 9 - Somaclonal variation and Micropropagation
- Lecture 10 - Somatic embryogenesis and Protoplast culture
- Lecture 11 - Synthetic seeds, Cryopreservation and Freezing methods
- Lecture 12 - Secondary metabolism in plant cells - Part 1
- Lecture 13 - Secondary metabolism in plant cells - Part 2
- Lecture 14 - Secondary metabolism in plant cells - Part 3
- Lecture 15 - Secondary metabolism in plant cells - Part 4
- Lecture 16 - Optimization strategies - Part 1
- Lecture 17 - Optimization strategies - Part 2
- Lecture 18 - Optimization strategies - Part 3
- Lecture 19 - Optimization strategies - Part 4
- Lecture 20 - Biotransformation in plant cultures
- Lecture 21 - Immobilization of plant cells
- Lecture 22 - Genetic transformations in plant cells - Part 1
- Lecture 23 - Genetic transformations in plant cells - Part 2
- Lecture 24 - Genetic transformations in plant cells - Part 3
- Lecture 25 - Plant Cell Bioreactors - Part 1
- Lecture 26 - Plant Cell Bioreactors - Part 2
- Lecture 27 - Bioreactors for Hairy Root cultures
- Lecture 28 - Case study - Part 1
- Lecture 29 - Case study - Part 2

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

NPTEL Video Course - Biotechnology - NOC:Tissue Engineering

Subject Co-ordinator - Prof.Vignesh Muthuvijayan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Tissue Engineering - Part 1
Lecture 2 - Introduction to Tissue Engineering - Part 2
Lecture 3 - Introduction to Tissue Engineering - Part 3
Lecture 4 - Scaffolds
Lecture 5 - Scaffolds
Lecture 6 - Scaffolds
Lecture 7 - Hydrogels - Part 1
Lecture 8 - Hydrogels - Part 2
Lecture 9 - Bioceramics
Lecture 10 - Scaffold fabrication strategies
Lecture 11 - Self Assembly
Lecture 12 - 3D Bioprinting
Lecture 13 - Material Characterization - Part 1
Lecture 14 - Material Characterization - Part 2
Lecture 15 - Material Characterization - Part 3
Lecture 16 - Cell Source
Lecture 17 - Cell Isolation - Part 1
Lecture 18 - Cell Isolation - Part 2
Lecture 19 - Tissue Dynamics
Lecture 20 - Cell Differentiation
Lecture 21 - Cell Adhesion
Lecture 22 - Cell Migration
Lecture 23 - Signaling and biomolecule delivery in Tissue Engineering
Lecture 24 - Bioreactors in Tissue Engineering
Lecture 25 - Challenges in Tissue Engineering
Lecture 26 - Host integration and immune responses - Part 1
Lecture 27 - Host integration and immune responses - Part 2
Lecture 28 - Bioethics of Tissue Engineering - Part 1
Lecture 29 - Bioethics of Tissue Engineering - Part 2

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

- Lecture 30 - Skin Tissue Engineering - Part 1
- Lecture 31 - Skin Tissue Engineering - Part 2
- Lecture 32 - Bone Tissue Engineering - Part 1
- Lecture 33 - Bone Tissue Engineering - Part 2
- Lecture 34 - Bone Tissue Engineering - Part 3
- Lecture 35 - Vascular Tissue Engineering
- Lecture 36 - Corneal Tissue Engineering - Part 1
- Lecture 37 - Corneal Tissue Engineering - Part 2

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

NPTEL Video Course - Biotechnology - NOC:Thermodynamics for Biological Systems: Classical and Statistical Aspects

Subject Co-ordinator - Prof. G.K. Suraiashkumar, Prof. Sanjib Senapati

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction and review
- Lecture 2 - Review (Continued...)
- Lecture 3 - Need for analysis
- Lecture 4 - Additional Thermodynamic Functions
- Lecture 5 - State and Path Variables
- Lecture 6 - Equations for a Closed System
- Lecture 7 - Chemical Potential
- Lecture 8 - Gibbs Duhem equation
- Lecture 9 - Maxwell's relations
- Lecture 10 - Inter-relationships between thermodynamic variables (Continued...)
- Lecture 11 - Some useful mathematical manipulations
- Lecture 12 - Thermodynamic relations for a closed system with 1 mole of pure substance
- Lecture 13 - Maximum work
- Lecture 14 - Open systems
- Lecture 15 - Equations of state - Virial equations
- Lecture 16 - Equations of state - Cubic equations
- Lecture 17 - Volume estimation
- Lecture 18 - Volume estimation (Continued...)
- Lecture 19 - Generalized correlations
- Lecture 20 - Generalized correlations (Continued...)
- Lecture 21 - Residual properties
- Lecture 22 - Residual properties (Continued...)
- Lecture 23 - Generalized correlations and residual properties
- Lecture 24 - Fugacity coefficient estimation
- Lecture 25 - Review of module 3
- Lecture 26 - Learning aspects
- Lecture 27 - Chemical potential formulations
- Lecture 28 - Lewis and Randall rule
- Lecture 29 - Partial molar properties

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

- Lecture 30 - Partial molar property estimation from mixing experiments
- Lecture 31 - Partial molar property estimation (Continued...)
- Lecture 32 - Activity coefficient from excess property
- Lecture 33 - Activity coefficient from excess property (Continued...)
- Lecture 34 - Models for activity coefficient in a binary system
- Lecture 35 - Models for activity coefficient for a binary system (Continued...)
- Lecture 36 - Review of module 4
- Lecture 37 - Criteria for phase equilibrium
- Lecture 38 - Phase rule for non-reacting systems
- Lecture 39 - Clausius Clayperon equation
- Lecture 40 - Clausius Clayperon equation (Continued...)
- Lecture 41 - Vapour liquid equilibrium
- Lecture 42 - Vapour liquid equilibrium (Continued...)
- Lecture 43 - Estimation of fugacity coefficient from P-V-T data at equilibrium
- Lecture 44 - Liquid-liquid and solid-liquid equilibria
- Lecture 45 - Review of module 5
- Lecture 46 - Criteria for bioreaction equilibria
- Lecture 47 - Phase rule for reacting biosystems
- Lecture 48 - Equilibrium constants
- Lecture 49 - Effect of temperature on the equilibrium constants
- Lecture 50 - Reaction in liquid or solid phases
- Lecture 51 - Free energy changes for some bioreactions
- Lecture 52 - Electrolytes
- Lecture 53 - Review of the classical thermodynamics part
- Lecture 54 - Introduction to Statistical thermodynamics
- Lecture 55 - Concepts of macro and microstates
- Lecture 56 - Thermodynamic probability
- Lecture 57 - Boltzmann distribution law
- Lecture 58 - Defining $\hat{\Omega}^2$ in Boltzmann distribution law
- Lecture 59 - Relationship between partition function and thermodynamic quantities
- Lecture 60 - Partition function of mono atomic gases
- Lecture 61 - Entropy in terms of probability
- Lecture 62 - Gibbs paradox
- Lecture 63 - Thermodynamic probability for distinguishable particles
- Lecture 64 - Thermodynamic probability for indistinguishable particles
- Lecture 65 - Sackur - Tetrode equation
- Lecture 66 - Partition function and Helmholtz and Gibbs free energy
- Lecture 67 - Ensemble approach
- Lecture 68 - Ensemble average, time average, Ergodic hypothesis

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- Lecture 69 - Partition function for classical systems
- Lecture 70 - Pair potentials for atomic systems
- Lecture 71 - Potential for molecular systems
- Lecture 72 - Computer code for LJ potential
- Lecture 73 - Introduction to computer simulations
- Lecture 74 - Computer simulations of macromolecules
- Lecture 75 - MD simulation examples
- Lecture 76 - Link between theory and experiments
- Lecture 77 - MD protocol
- Lecture 78 - Computer simulation tricks
- Lecture 79 - Understanding force fields
- Lecture 80 - Idea of Z-matrix
- Lecture 81 - Basics of MD simulations
- Lecture 82 - Integration algorithms
- Lecture 83 - Calculation of Columbic force
- Lecture 84 - Calculation of LJ force
- Lecture 85 - Monte Carlo simulations
- Lecture 86 - Analysis of MD trajectory
- Lecture 87 - Case study (water)

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 $K_L a$
- Lecture 64 - Gas-Liquid Interphase Transport
- Lecture 65 - Gas-Liquid Interphase Transport (Continued...)
- Lecture 66 - Bioreactor $K_L a$ Estimation
- Lecture 67 - Liquid Phase Oxygen-Supply Strategy
- Lecture 68 - LPOS and Its Mechanism

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

- 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

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

NPTEL Video Course - Biotechnology - NOC:Introduction to Developmental Biology

Subject Co-ordinator - Prof. Subramaniam K

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction
- Lecture 2 - Life cycles and evolution of developmental patterns
- Lecture 3 - Experimental embryology
- Lecture 4 - Differential gene expression - Part 1
- Lecture 5 - Differential gene expression - Part 2
- Lecture 6 - Differential gene expression - Part 3
- Lecture 7 - Differential gene expression - Part 4
- Lecture 8 - Genetic basis - Part 1
- Lecture 9 - Genetic basis - Part 2
- Lecture 10 - Genetic basis - Part 3
- Lecture 11 - Genetic basis - Part 4
- Lecture 12 - Genetic basis - Part 5
- Lecture 13 - Cell-cell communication - Part 1
- Lecture 14 - Cell-cell communication - Part 2
- Lecture 15 - Cell-cell communication - Part 3
- Lecture 16 - Cell-cell communication - Part 4
- Lecture 17 - Genetics of axis formation in Drosophila - Part 1
- Lecture 18 - Genetics of axis formation in Drosophila - Part 2
- Lecture 19 - Genetics of axis formation in Drosophila - Part 3
- Lecture 20 - Genetics of axis formation in Drosophila - Part 4
- Lecture 21 - Plant Development - Part 1
- Lecture 22 - Plant Development - Part 2
- Lecture 23 - Plant Development - Part 3
- Lecture 24 - Early Mammalian Development - Part 1
- Lecture 25 - Early Mammalian Development - Part 2
- Lecture 26 - Evolutionary Developmental Biology - Part 1
- Lecture 27 - Evolutionary Developmental Biology - Part 2
- Lecture 28 - Evolutionary Developmental Biology - Part 3

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

NPTEL Video Course - Biotechnology - NOC:Bioreactor Design and Analysis

Subject Co-ordinator - Prof. Smita Srivastava

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to the course - Part 1
Lecture 2 - Introduction to the course - Part 2
Lecture 3 - Design of Batch Bioreactors - Part 1
Lecture 4 - Design of Batch Bioreactors - Part 2
Lecture 5 - Design of Batch Bioreactors - Part 3
Lecture 6 - Design of Batch Bioreactors - Part 4
Lecture 7 - Design of Batch Bioreactors - Practice problems
Lecture 8 - Design of Fed Batch bioreactors - Part 1
Lecture 9 - Design of Fed Batch bioreactors - Part 2
Lecture 10 - Design of Fed Batch bioreactors - Practice problems - Part 1
Lecture 11 - Design of Fed Batch bioreactors - Practice Problems - Part 2
Lecture 12 - Design of Fed Batch bioreactors - Practice Problems - Part 3
Lecture 13 - Design of Continuous Bioreactors - Part 1
Lecture 14 - Design of Continuous Bioreactors - Part 2
Lecture 15 - Design of Continuous Bioreactors - Part 3
Lecture 16 - Design of Continuous bioreactors - Practice Problems - Part 1
Lecture 17 - Design of Continuous bioreactors - Practice Problems - Part 1
Lecture 18 - Design of Continuous bioreactors - Practice Problems - Part 2
Lecture 19 - Mass Transfer in Bioreactors - Part 1
Lecture 20 - Mass Transfer in Bioreactors - Part 2
Lecture 21 - Mass Transfer in Bioreactors - Part 3
Lecture 22 - Rheology of fluids
Lecture 23 - Mass Transfer in Bioreactors - Practice Problems
Lecture 24 - Heterogeneous reactions in Bioreactors - Part 1
Lecture 25 - Heterogeneous reactions in Bioreactors - Part 2
Lecture 26 - Heterogeneous reactions in Bioreactors - Part 3
Lecture 27 - Heterogeneous reactions in Bioreactors - Practice Problems
Lecture 28 - Heat Transfer Operations in Bioreactors - Part 1
Lecture 29 - Heat Transfer Operations in Bioreactors - Part 2

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- Lecture 30 - Heat Transfer Operations in Bioreactors - Part 3
- Lecture 31 - Heat Transfer Operations in Bioreactors - Part 4
- Lecture 32 - Heat Transfer Operations in Bioreactors - Practice Problems
- Lecture 33 - Scale up of Bioreactors - Part 1
- Lecture 34 - Scale up of Bioreactors - Part 2
- Lecture 35 - Scale up of Bioreactors - Part 3
- Lecture 36 - Scale up of Bioreactors - Part 4
- Lecture 37 - Scale up of Bioreactors - Practice Problems
- Lecture 38 - Non-ideal reactors: design and analysis - Part 1
- Lecture 39 - Non-ideal reactors: design and analysis - Part 2
- Lecture 40 - Non-ideal reactors: design and analysis - Practice Problems

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

NPTEL Video Course - Biotechnology - NOC:Biochemistry (IITM)

Subject Co-ordinator - Prof. Subramaniam K

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Biomolecules - Part 1
Lecture 2 - Introduction to Biomolecules - Part 2
Lecture 3 - Stereochemistry and Properties of Water - Part 1
Lecture 4 - Properties of Water - Part 2 and Introduction to Proteins
Lecture 5 - Characteristics of Proteins and Chromatography techniques
Lecture 6 - Electrophoresis of Proteins and Protein Sequencing
Lecture 7 - Synthesis of Polypeptides and Enzymes - Part 1
Lecture 8 - Enzymes - Part 2
Lecture 9 - Enzymes - Part 3
Lecture 10 - Enzymes - Part 4
Lecture 11 - Enzymes - Part 5 and Carbohydrates - Part 1
Lecture 12 - Carbohydrates - Part 2 and Lipids - Part 1
Lecture 13 - Lipids - Part 2
Lecture 14 - Lipids - Part 3 and Introduction to Metabolism - Part 1
Lecture 15 - Introduction to metabolism - Part 2
Lecture 16 - Bioenergetics - Part 1
Lecture 17 - Bioenergetics - Part 2
Lecture 18 - Glycolysis - Part 1
Lecture 19 - Glycolysis - Part 2
Lecture 20 - Citric Acid Cycle - Part 1
Lecture 21 - Citric Acid Cycle - Part 2
Lecture 22 - Oxidative Phosphorylation - Part 1
Lecture 23 - Oxidative Phosphorylation - Part 2
Lecture 24 - Photosynthesis and Carbon assimilation - Part 1
Lecture 25 - Photosynthesis and Carbon Assimilation - Part 2
Lecture 26 - Photosynthesis and Carbon assimilation - Part 3
Lecture 27 - Nitrogen Metabolism
Lecture 28 - Catabolism of Amino acids
Lecture 29 - Urea cycle and Fatty acid catabolism - Part 1

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

- Lecture 30 - Fatty acid catabolism - Part 2
- Lecture 31 - Fatty Acid Biosynthesis
- Lecture 32 - Cholesterol Biosynthesis and Lipid transport - Part 1
- Lecture 33 - Cholesterol Biosynthesis and Lipid transport - Part 2
- Lecture 34 - Hormonal Regulation and Integration of Mammalian Metabolism

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

NPTEL Video Course - Biotechnology - NOC:Cellular Biophysics: A Framework for Quantitative Biology

Subject Co-ordinator - Prof. R. Chaitanya A. Athale

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction - Part 1

Lecture 2 - Introduction - Part 2

Lecture 3 - Introduction - Part 3

Lecture 4 - Solids vs Fluids

Lecture 5 - Viscosity

Lecture 6 - Measuring Viscosity

Lecture 7 - Tutorial - Part 1

Lecture 8 - Tutorial - Part 2

Lecture 9 - Tutorial - Part 3

Lecture 10 - Macromolecular Nature and Hydrophobicity, Structure of Ice, Pauling-Bernal-Fowler Model of Water

Lecture 11 - Entropy and Probability of Water Conformations, Boltzmann Law of Entropy

Lecture 12 - Reynolds Number

Lecture 13 - Tutorial - Part 1

Lecture 14 - Tutorial - Part 2

Lecture 15 - Tutorial - Part 3

Lecture 16 - Hagen-Poiseuille Equation

Lecture 17 - Tutorial - Part 4

Lecture 18 - Sedimentation and Centrifugation - Part 1

Lecture 19 - Sedimentation and Centrifugation - Part 2

Lecture 20 - Blood Centrifugation

Lecture 21 - Review: Paperfuge for Hematology

Lecture 22 - Biology by Numbers

Lecture 23 - Biology by Numbers: Bomb Yield Solved

Lecture 24 - Order of Magnitude Estimates and Approximations

Lecture 25 - Physical Basis of Life

Lecture 26 - Approximating Cellular and Molecular Size Scales

Lecture 27 - Quantifying DNA and Chromatin

Lecture 28 - Protein Abundance and Spacing

Lecture 29 - Model Gene

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- Lecture 30 - Cell-Biology by Numbers
- Lecture 31 - Experimental Techniques to Quantify Cells
- Lecture 32 - Time-Scales in Cells
- Lecture 33 - Energy Scale
- Lecture 34 - Energy and Thermodynamics of Life - Part 1
- Lecture 35 - Energy and Thermodynamics of Life - Part 2
- Lecture 36 - Energy and Life- Osmotic Engine
- Lecture 37 - Energy and Life- Interconversion of Energy
- Lecture 38 - Random Walk Statistics, Stoke-Einstein - Part 1
- Lecture 39 - Random Walk Statistics, Stoke-Einstein - Part 2
- Lecture 40 - Demonstration of Diffusion of Micron Sized Particles
- Lecture 41 - Macromolecular Crowding - Part 1
- Lecture 42 - Macromolecular Crowding - Part 2
- Lecture 43 - Cytoskeleton
- Lecture 44 - Beam Theory Applied to Biopolymer
- Lecture 45 - Understanding Chromosomes as Statistical Polymers - Part 1
- Lecture 46 - Understanding Chromosomes as Statistical Polymers - Part 2
- Lecture 47 - Brownian Ratchets and Molecular Motors
- Lecture 48 - Polymerization Dynamics - Part 1
- Lecture 49 - Polymerization Dynamics - Part 2
- Lecture 50 - Polymerization Dynamics - Part 3
- Lecture 51 - Python Programming - Part 1
- Lecture 52 - Python Programming - Part 2
- Lecture 53 - Python Programming - Part 3
- Lecture 54 - Introduction to Membrane Mechanics
- Lecture 55 - Membrane Deformation
- Lecture 56 - Developmental Pattern Formation
- Lecture 57 - Turing Model
- Lecture 58 - Phyllotaxis - Part 1
- Lecture 59 - Phyllotaxis - Part 2
- Lecture 60 - Phyllotaxis - Part 3

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

NPTEL Video Course - Biotechnology - NOC:Medical Image Analysis

Subject Co-ordinator - Prof. Ganapathy Krishnamurthi

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Medical Image Analysis - Introduction
Lecture 2 - X-ray imaging
Lecture 3 - MRI Physics
Lecture 4 - Magnetic Resonance Image Acquisition
Lecture 5 - Ultrasound Imaging
Lecture 6 - Radionuclide Imaging
Lecture 7 - Basic Image Processing Methods
Lecture 8 - Contrast Enhancement
Lecture 9 - Histogram Equalization
Lecture 10 - Edge Enhancement - Laplacian
Lecture 11 - Noise Reduction
Lecture 12 - Diffusion Filtering
Lecture 13 - Bayesian Image Restoration
Lecture 14 - Registration Introduction
Lecture 15 - Framework
Lecture 16 - Image Coordinates
Lecture 17 - Transforms
Lecture 18 - Metrics
Lecture 19 - NonRigid Registration
Lecture 20 - Demons part - 1
Lecture 21 - Demons part - 2
Lecture 22 - FFDBSplines
Lecture 23 - Endoscopy - Where are we with AI ?
Lecture 24 - Computer vision and DL in the operating room
Lecture 25 - ML in intraoperative tissue identification
Lecture 26 - Basic Image Processing Techniques Using MATLAB
Lecture 27 - Image Registration Using Matlab
Lecture 28 - Basic Image Processing Techniques Using Python
Lecture 29 - Calculus of variations

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

- Lecture 30 - Snakes - Active Contour Models
- Lecture 31 - Level Sets, Geodesic Active Contours, Mumford-Shah Functional, Chan-Vese
- Lecture 32 - Mumford-Shah Functional, Chan-Vese
- Lecture 33 - Segmentation Models Demo [Snakes (Active Contours) Chan-Vese segmentation, Geodesic active Cont
- Lecture 34 - Active Shape Models
- Lecture 35 - Snake tutorial
- Lecture 36 - Level Set Method
- Lecture 37 - Chan Vese Segmentation
- Lecture 38 - Neural Networks Introduction
- Lecture 39 - Linear Regression
- Lecture 40 - Gradient Descent Formulation
- Lecture 41 - Linear Regression Demo
- Lecture 42 - Feed forward neural Networks
- Lecture 43 - Example with XOR
- Lecture 44 - Introduction to CNNs
- Lecture 45 - Max Pooling
- Lecture 46 - Applications of Cnns
- Lecture 47 - CNN Training
- Lecture 48 - Semantic Segmentation
- Lecture 49 - Classification Demo in Pytorch
- Lecture 50 - Generative Models
- Lecture 51 - GAN Final Demo

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

NPTEL Video Course - Biotechnology - NOC:Organ Printing

Subject Co-ordinator - Prof. Falguni Pati

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to Organ Printing course and Content Discussion
- Lecture 2 - Introduction to 3D Bioprinting
- Lecture 3 - Introduction to Inkjet 3D Bioprinting
- Lecture 4 - Introduction to Inkjet 3D Bioprinting (Continued...)
- Lecture 5 - Introduction to Extrusion Bioprinting
- Lecture 6 - Introduction to Extrusion 3D Bioprinting (Continued...)
- Lecture 7 - Introduction to Laser-assisted Bioprinting
- Lecture 8 - Comparison of Different Bioprinting Techniques - Part 1
- Lecture 9 - Comparison of Different Bioprinting Techniques - Part 2
- Lecture 10 - 3D Bioprinting in Support Bath
- Lecture 11 - Introduction to Bioinks
- Lecture 12 - Important material requirement for Bioink development
- Lecture 13 - Crosslinking of Hydrogels for Bioprinting
- Lecture 14 - Single-Material and Multimaterial Bioink Systems
- Lecture 15 - Printability for Extrusion Bioprinting
- Lecture 16 - What is required and how to print an organ?
- Lecture 17 - Level of complexity in Tissues/Organs for Bioprinting
- Lecture 18 - Design approaches in Bioprinting
- Lecture 19 - Bioprinting of Vasculature
- Lecture 20 - Direct printing of vasculature
- Lecture 21 - Indirect printing of vasculature
- Lecture 22 - Design of Cornea Tissue-Specific Bioink and 3D Bioprinting of Cornea
- Lecture 23 - Design of Cornea Tissue-Specific Bioink and 3D Bioprinting of Cornea (Continued...)
- Lecture 24 - Bioprinting of Heart
- Lecture 25 - Bioprinting of Liver
- Lecture 26 - Bioprinting of Kidney
- Lecture 27 - Bioprinting of Lung
- Lecture 28 - 4D Bioprinting - Part 1
- Lecture 29 - 4D Bioprinting - Part 2

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- Lecture 30 - 4D Bioprinting - Part 3
- Lecture 31 - In Situ Bioprinting
- Lecture 32 - In Situ Bioprinting (Continued...)
- Lecture 33 - Medical Modeling for Organ Printing
- Lecture 34 - Medical Modeling for Organ Printing (Continued...)
- Lecture 35 - Next Step in Bioprinting
- Lecture 36 - Next Step in Bioprinting (Continued...)
- Lecture 37 - Ethical Issues related to Organ Printing

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

NPTEL Video Course - Biotechnology - NOC:Introduction to Cell Biology

Subject Co-ordinator - Prof. Girish Ratnaparkhi

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - An Overview of Central Dogma of Molecular Biology - Part 1
- Lecture 2 - An Overview of Central Dogma of Molecular Biology - Part 2
- Lecture 3 - Central Dogma : The DNA Structure - Part 1
- Lecture 4 - Central Dogma : The DNA Structure - Part 2
- Lecture 5 - Central Dogma : The DNA Structure - Part 3
- Lecture 6 - Central Dogma : Replication of DNA - Part 1
- Lecture 7 - Central Dogma : Replication of DNA - Part 2
- Lecture 8 - Central Dogma : Transcription - Part 1
- Lecture 9 - Central Dogma : Transcription - Part 2
- Lecture 10 - Central Dogma : Transcription - Part 3
- Lecture 11 - Central Dogma : Translation - Part 1
- Lecture 12 - Central Dogma : Translation - Part 2
- Lecture 13 - Central Dogma : Translation - Part 3
- Lecture 14 - Protein Structure, Folding and Function - Part 1
- Lecture 15 - Protein Structure, Folding and Function - Part 2
- Lecture 16 - Secondary Structure of Proteins: Ramachandran Plot - Part 1
- Lecture 17 - Secondary Structure of Proteins: Ramachandran Plot - Part 2
- Lecture 18 - Protein Structure, Folding and Function - Part 3
- Lecture 19 - Protein Structure, Folding and Function - Part 4
- Lecture 20 - Protein Structure, Folding and Function - Part 5
- Lecture 21 - Protein Structure, Folding and Function - Part 6
- Lecture 22 - Enzymes, Carbohydrates and Lipids
- Lecture 23 - Introduction to Genetics - Part 1
- Lecture 24 - Introduction to Genetics - Part 2
- Lecture 25 - Introduction to Genetics - Part 3
- Lecture 26 - Mendelian and Non-Mendelian Genetics - Part 1
- Lecture 27 - Mendelian and Non-Mendelian Genetics - Part 2
- Lecture 28 - Mendelian and Non-Mendelian Genetics - Part 3
- Lecture 29 - Introduction to Microscopy - Part 1

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

- Lecture 30 - Introduction to Microscopy - Part 2
- Lecture 31 - Introduction to Microscopy - Part 3
- Lecture 32 - Biology of Cells - Part 1
- Lecture 33 - Biology of Cells - Part 2
- Lecture 34 - Complexity and Compartmentalization in Cells - Part 1
- Lecture 35 - Complexity and Compartmentalization in Cells - Part 2
- Lecture 36 - Endosymbiont Theory
- Lecture 37 - Structure of the Cell: Cell Wall and Cell Membrane
- Lecture 38 - Structure of the Cell: Discussion Session
- Lecture 39 - Plasma Membrane: The Boundaries of Life
- Lecture 40 - Plasma Membrane: Discussion Session
- Lecture 41 - Introduction to Cytoskeleton - Part 1
- Lecture 42 - Cytoskeleton: Discussion Session 1
- Lecture 43 - Introduction to Cytoskeleton - Part 2
- Lecture 44 - Cytoskeleton: Discussion Session 2
- Lecture 45 - Motor Proteins in Cell
- Lecture 46 - Motor Proteins in Cell: Discussion Session
- Lecture 47 - Discussion on Directionality of Motor Protein
- Lecture 48 - Endomembrane System of Cells - Part 1
- Lecture 49 - Endomembrane System of Cells: Discussion Session 1
- Lecture 50 - Endomembrane System of Cells - Part 2
- Lecture 51 - Endomembrane System of Cells: Discussion Session 2
- Lecture 52 - Endomembrane System of Cells - Part 3
- Lecture 53 - Endomembrane System of Cells: Discussion Session 3
- Lecture 54 - Endomembrane System of Cells - Part 4
- Lecture 55 - Endomembrane System of Cells: Discussion Session 4
- Lecture 56 - Cell Division
- Lecture 57 - Cell Division: Discussion session
- Lecture 58 - Discussion Session on Organization and Function of a Cell

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

NPTEL Video Course - Biotechnology - NOC:RNA Biology

Subject Co-ordinator - Prof. Rajesh Ramachandran

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to RNA Biology and RNA World - The Beginning
- Lecture 2 - Introduction to RNA Biology and RNA World - Evidences
- Lecture 3 - Introduction to RNA Biology and RNA World - Origin of Monomers
- Lecture 4 - Introduction to RNA Biology and RNA World - Shift to DNA
- Lecture 5 - Introduction to RNA Biology and RNA World - RNA Self Replication
- Lecture 6 - Introduction to RNA Biology and RNA World - Origin of RNA Enzymes
- Lecture 7 - RNA as Enzymes: The Ribozymes
- Lecture 8 - RNA as Enzymes: Structure and Functions
- Lecture 9 - RNA as Enzymes: The Present and Future
- Lecture 10 - RNA Transcription: The Central Dogma
- Lecture 11 - RNA Transcription: Initial Steps
- Lecture 12 - RNA Transcription: Different Stages
- Lecture 13 - RNA Transcription: Termination and RNA Modification
- Lecture 14 - RNA Transcription: Different Polymerases
- Lecture 15 - RNA Processing and Life Cycle: RNA Maturation and RNPs
- Lecture 16 - RNA Processing and Life Cycle: RNA Splicing
- Lecture 17 - RNA Processing and Life Cycle: Post Transcriptional Processing
- Lecture 18 - Alternative RNA Processing and Editing: Alternative Splicing
- Lecture 19 - Alternative RNA Processing and Editing: Implications of Introns
- Lecture 20 - Alternative RNA Processing and Editing: Splicing and Pathology
- Lecture 21 - Alternative RNA Processing and Editing: RNA Editing in Detail
- Lecture 22 - Alternative RNA Processing and Editing: Relevance of RNA Editing
- Lecture 23 - Alternative RNA Processing and Editing: Relevance in Immunology
- Lecture 24 - RNA Splicing, Export and Stability: Relevance of Introns
- Lecture 25 - RNA Splicing, Export and Stability: Introns in RNA Splicing
- Lecture 26 - RNA Splicing, Export and Stability: Different Spliceosomes
- Lecture 27 - RNA Splicing, Export and Stability: SMN Complex
- Lecture 28 - snRNA, rRNA, miRNA, siRNA Processing, Export and Function: Introns and Link to Splicing
- Lecture 29 - snRNA, rRNA, miRNA, siRNA Processing, Export and Function: RNA Helicases

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- Lecture 30 - snRNA, rRNA, miRNA, siRNA Processing, Export and Function: Nucleo Cytoplasmic Transport
- Lecture 31 - snRNA, rRNA, miRNA, siRNA Processing, Export and Function: Nucleoporins and miRNAs
- Lecture 32 - snRNA, rRNA, miRNA, siRNA Processing, Export and Function: RNA Export Mechanisms
- Lecture 33 - snRNA, rRNA, miRNA, siRNA Processing, Export and Function: RNA Quality Control
- Lecture 34 - Mechanisms of RNA Decay and Non Coding RNAs: Decay Pathways
- Lecture 35 - Mechanisms of RNA Decay and Non Coding RNAs: The Exosomes
- Lecture 36 - Mechanisms of RNA Decay and Non Coding RNAs: mRNA Surveillance
- Lecture 37 - Mechanisms of RNA Decay and Non Coding RNAs: Mechanisms of RNA Decay
- Lecture 38 - Mechanisms of RNA Decay and Non Coding RNAs: Autoregulation of RNAs
- Lecture 39 - Mechanisms of RNA Decay and Non Coding RNAs: Introduction to Non-Coding RNAs
- Lecture 40 - Dosage Compensation and X-Inactivation: SRP and Different Modes of Compensation
- Lecture 41 - Dosage Compensation and X-Inactivation: Dosage Compensation of X
- Lecture 42 - Dosage Compensation and X-Inactivation: Omprinted vs Random X Inactivation
- Lecture 43 - Dosage Compensation and X-Inactivation: Molecular Basis of X-Inactivation
- Lecture 44 - Dosage Compensation and X-Inactivation: ES Cells and X-Inactivation
- Lecture 45 - Dosage Compensation, Xist and ncRNA in Imprinting: The Roles of YY1
- Lecture 46 - Dosage Compensation, Xist and ncRNA in Imprinting: shRNAs and Gene Expression
- Lecture 47 - Dosage Compensation, Xist and ncRNA in Imprinting: Mechanism of RNAi in Action
- Lecture 48 - Dosage Compensation, Xist and ncRNA in Imprinting: Genomic Imprinting in Action
- Lecture 49 - Dosage Compensation, Xist and ncRNA in Imprinting: Different ncRNAs and their Roles
- Lecture 50 - Dosage Compensation, Xist and ncRNA in Imprinting: lncRNA-Induced Cancer
- Lecture 51 - Dosage Compensation, Xist and ncRNA in Imprinting: Xist and Cancer
- Lecture 52 - Telomere, Telomerase and Impact on Genomes: The Importance of Telomeres
- Lecture 53 - Telomere, Telomerase and Impact on Genomes: Telomerase and Aging
- Lecture 54 - Telomere, Telomerase and Impact on Genomes: Telomere Length as Marker of Aging
- Lecture 55 - Telomere, Telomerase and Impact on Genomes: Telomeres and Cancer
- Lecture 56 - Telomere, Telomerase and Impact on Genomes: Cell Cycle Arrest
- Lecture 57 - Telomere, Telomerase and Impact on Genomes: Maintenance and Manipulation of Telomeres
- Lecture 58 - Epitranscriptome and Protein Synthesis: Important RNA Modifications
- Lecture 59 - Epitranscriptome and Protein Synthesis: Readers, Writes and Erasers
- Lecture 60 - Epitranscriptome and Protein Synthesis: Biological Implications of RNA Modifications
- Lecture 61 - Epitranscriptome and Protein Synthesis: Roles of RNAs in Translation
- Lecture 62 - Epitranscriptome and Protein Synthesis: Mechanism of Translation

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

NPTEL Video Course - Biotechnology - NOC:Biomechanics

Subject Co-ordinator - Prof. Varadhan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to forces - Resolving forces, principle of transmissibility

Lecture 2 - Statics FBD and EOE

Lecture 3 - Example problems on FBD and EOE

Lecture 4 - Joints in human body

Lecture 5 - Machines and mechanical advantage

Lecture 6 - Levers and types of levers

Lecture 7 - Insertion point and torque

Lecture 8 - Practice problem - 1

Lecture 9 - Practice problem - 2

Lecture 10 - Key terminologies

Lecture 11 - Anatomical planes and axis

Lecture 12 - Sagittal plane movements

Lecture 13 - Coronal plane movements

Lecture 14 - Transverse plane movements

Lecture 15 - Muscles - Muscle fascicles

Lecture 16 - Muscle fibers- Pennation angle

Lecture 17 - More on pennation angle

Lecture 18 - Excitation contraction coupling

Lecture 19 - Sliding filament theory

Lecture 20 - Force length relationship

Lecture 21 - Shoulder joints and muscles

Lecture 22 - Shoulder problem - 1

Lecture 23 - Shoulder problem - 2

Lecture 24 - Elbow theory

Lecture 25 - Elbow problem - 1

Lecture 26 - Elbow problem - 2

Lecture 27 - Elbow problem - 3

Lecture 28 - Wrist theory

Lecture 29 - Finger theory

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- Lecture 30 - Finger muscles
- Lecture 31 - Spine anatomy and movements
- Lecture 32 - Spine muscles
- Lecture 33 - Spine problem
- Lecture 34 - Hip anatomy and movements
- Lecture 35 - Hip muscles
- Lecture 36 - Hip problem
- Lecture 37 - Knee anatomy and movements
- Lecture 38 - Knee muscles
- Lecture 39 - Knee problem
- Lecture 40 - Ankle anatomy and movements
- Lecture 41 - Ankle muscles
- Lecture 42 - Ankle problem
- Lecture 43 - Grasping- reaching- chains
- Lecture 44 - D.O.F mobility, open/closed chain
- Lecture 45 - Forward kinematics and workspace
- Lecture 46 - 2R inverse kinematics
- Lecture 47 - 3R kinematics forward and inverse
- Lecture 48 - D-H parameters
- Lecture 49 - Velocity and jacobian
- Lecture 50 - 3R velocity
- Lecture 51 - Tissues and types of tissues
- Lecture 52 - Bone microstructure and cells
- Lecture 53 - Properties of bones
- Lecture 54 - Wolffs Law and Hookean behavior
- Lecture 55 - Elastic properties and stress strain relations
- Lecture 56 - Stress strain curve and mechanical properties of biological materials
- Lecture 57 - Bending of Bones
- Lecture 58 - Viscoelastic modelling
- Lecture 59 - Maxwell Model
- Lecture 60 - Voight Model
- Lecture 61 - Kelvin model
- Lecture 62 - Viscoelasticity in bones
- Lecture 63 - Tissues and its constituents
- Lecture 64 - Cartilages, ligaments and tendons
- Lecture 65 - Stress strain relations in tendons
- Lecture 66 - Tendon forces and factors affecting tendon property
- Lecture 67 - Gliding resistance, tendon wrapping and friction forces
- Lecture 68 - Enslaving - Intertendinous force transfer and motor units

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

- Lecture 69 - Introduction to enslavement
- Lecture 70 - Enslaving effects in finger force production - 1
- Lecture 71 - Enslaving effects in finger force production - 2
- Lecture 72 - Wrist posture and finger interdependence - 1
- Lecture 73 - Wrist posture and finger interdependence - 2
- Lecture 74 - Wrist posture and finger interdependence - 3
- Lecture 75 - Measurement of orientation in 3D space - Devices
- Lecture 76 - Rotation matrices in 2D and 3D2
- Lecture 77 - Animating using rotation matrices- Matlab Examples
- Lecture 78 - Composite rotation matrix and relative orientations
- Lecture 79 - Complex numbers and quaternions
- Lecture 80 - Singularity, Gimbal Lock, Advantages and disadvantages of parameterization methods
- Lecture 81 - Single finger kinematics measurement using IMU's
- Lecture 82 - IMU based Full hand kinematics measurement system (HKMS)
- Lecture 83 - Demonstration of the Hand Kinematics Measurement System (HKMS)
- Lecture 84 - Introduction to Gait and running

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

NPTEL Video Course - Biotechnology - Introduction to Synthetic Biology

Subject Co-ordinator - Prof. Karthik Raman

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Synthetic Biology - Day 1 Part 1
Lecture 2 - Introduction to Synthetic Biology - Day 1 Part 2
Lecture 3 - Introduction to Synthetic Biology - Day 1 Part 3
Lecture 4 - Introduction to Synthetic Biology - Day 1 Part 4
Lecture 5 - Introduction to Synthetic Biology - Day 2 Part 1
Lecture 6 - Introduction to Synthetic Biology - Day 2 Part 2
Lecture 7 - Introduction to Synthetic Biology - Day 2 Part 3
Lecture 8 - Introduction to Synthetic Biology - Day 2 Part 4
Lecture 9 - Introduction to Synthetic Biology - Day 3 Part 1
Lecture 10 - Introduction to Synthetic Biology - Day 3 Part 2
Lecture 11 - Introduction to Synthetic Biology - Day 3 Part 3
Lecture 12 - Introduction to Synthetic Biology - Day 3 Part 4
Lecture 13 - Introduction to Synthetic Biology - Day 4 Part 1
Lecture 14 - Introduction to Synthetic Biology - Day 4 Part 2
Lecture 15 - Introduction to Synthetic Biology - Day 4 Part 3
Lecture 16 - Introduction to Synthetic Biology - Day 5 Part 1
Lecture 17 - Introduction to Synthetic Biology - Day 5 Part 2
Lecture 18 - Introduction to Synthetic Biology - Day 5 Part 3
Lecture 19 - Introduction to Synthetic Biology - Day 5 Part 4
Lecture 20 - Introduction to Synthetic Biology - Day 6 Part 1
Lecture 21 - Introduction to Synthetic Biology - Day 6 Part 2
Lecture 22 - Introduction to Synthetic Biology - Day 6 Part 3
Lecture 23 - Introduction to Synthetic Biology - Day 7 Part 1
Lecture 24 - Introduction to Synthetic Biology - Day 7 Part 2
Lecture 25 - Introduction to Synthetic Biology - Day 7 Part 3
Lecture 26 - Introduction to Synthetic Biology - Day 8 Part 1
Lecture 27 - Introduction to Synthetic Biology - Day 8 Part 2
Lecture 28 - Introduction to Synthetic Biology - Day 9 Part 1
Lecture 29 - Introduction to Synthetic Biology - Day 9 Part 2

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

- Lecture 30 - Introduction to Synthetic Biology - Day 9 Part 3
- Lecture 31 - Introduction to Synthetic Biology - Day 10 Part 1
- Lecture 32 - Introduction to Synthetic Biology - Day 10 Part 2
- Lecture 33 - Introduction to Synthetic Biology - Day 10 Part 3

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

NPTEL Video Course - Biotechnology - NOC:Computational Genomics

Subject Co-ordinator - Prof. Vineet Kumar Sharma

Co-ordinating Institute - IISER Bhopal

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

Lecture 1 - Introduction to Different OMICS Approaches and their Applications

Lecture 2 - Genetic Information in Prokaryotic

Lecture 3 - Databases and Web Resources to Store and Access the Biological Data

Lecture 4 - First and Second Generation Sequencing Technologies

Lecture 5 - Long Read Sequencing and Linked Read Sequencing - Part 1

Lecture 6 - Long Read Sequencing and Linked Read Sequencing - Part 2

Lecture 7 - Sequence Formats and Databases for Genomic Analysis

Lecture 8 - Introduction to Linux

Lecture 9 - File Handling and Remote Connectivity in Linux

Lecture 10 - Running Linux Commands and Installation of Genomic Packages

Lecture 11 - Introduction to R and Applications in Genomic Analysis

Lecture 12 - Publicly Available Tools and Need for Workstations for Genomic Analysis

Lecture 13 - Overview of Genomic and Transcriptomic Analysis

Lecture 14 - Genomic and Transcriptomic Analysis of an Organism with Case Studies

Lecture 15 - How to Collect and Confirm Sample of the Species to be Sequenced and Transcriptome Sequencing Approaches

Lecture 16 - Estimating the Amount of Sequencing Coverage for a Genome and Hybrid Sequencing Approaches

Lecture 17 - Types of Reads, Quality Filtering, Estimating the Genome Complexity and Heterozygosity

Lecture 18 - Genome Assembly and its Completion Status, Assembly Algorithms

Lecture 19 - Commonly Used Assembly Tools

Lecture 20 - Linked-Read Sequencing and Processing

Lecture 21 - Long Reads Analysis and Assembly Workflow

Lecture 22 - De novo Assembly Using Genomic and Transcriptomic Reads

Lecture 23 - Merging Assemblies to Create Hybrid Assembly and Determining the Quality of Assembly

Lecture 24 - Chromosomal Level Assembly and Case Studies

Lecture 25 - Identification and Annotation of Repeats in Genomes

Lecture 26 - De novo Transcriptome Assembly and Making the Coding Gene Set

Lecture 27 - Prediction of tRNA, rRNA and miRNA in a Genome

Lecture 28 - Functional Annotation and Identification of Metabolic Pathways in a Genome

Lecture 29 - Comprehensive Functional Annotation of Predicted Genes in a Genome

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

- Lecture 30 - Functional Annotation of Predicted Genes by Alternate Methods
- Lecture 31 - Methods and Steps to Perform the Evolutionary Analysis of a Genome
- Lecture 32 - Methods for Taxonomic Classification and Phylogeny Reconstruction and Analysis
- Lecture 33 - Epigenetics, ChIP-seq, Transcriptome and Microarrays for Regulation of Expression
- Lecture 34 - Single Cell Genomics, 10X Chromium Linked-reads and Illumina Sequencing, Single Cell Gene Expression
- Lecture 35 - Application of Multiomics Approaches in Human Health and Diseases Such as Cancer, Diabetes, etc.
- Lecture 36 - Prokaryotic Genome Sequencing and Assembly Approaches
- Lecture 37 - Gene Prediction Approaches and Common Methods for Bacterial Gene Prediction
- Lecture 38 - Common Methods for Annotation of a Bacterial Genome, t-RNA, rRNA, Operon Prediction and Annotation
- Lecture 39 - Phylogenetic Analysis of Bacterial Genomes
- Lecture 40 - Metabolic and Comparative Analysis
- Lecture 41 - Microbiome and Metagenome, Human, Organismal and Environmental Microbiomes
- Lecture 42 - Sequencing and Assembly of Metagenomes, Gene Prediction, Annotation, MAGs - Part 1
- Lecture 43 - Sequencing and Assembly of Metagenomes, Gene Prediction, Annotation, MAGs - Part 2
- Lecture 44 - Taxonomic Analysis Using Amplicon Sequence Variants, Statistical Analysis

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

NPTEL Video Course - Biotechnology - NOC:Human Physiology

Subject Co-ordinator - Prof. Nishikant Subedar

Co-ordinating Institute - IISER Bhopal

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

- Lecture 1 - Introduction to Homeostasis
- Lecture 2 - Mechanisms of Homeostasis - Part 1
- Lecture 3 - Mechanisms of Homeostasis - Part 2
- Lecture 4 - Physiology of muscle - Part 1
- Lecture 5 - Physiology of muscle - Part 2
- Lecture 6 - Molecular Mechanism of muscle contractility - Part 1
- Lecture 7 - Molecular Mechanism of muscle contractility - Part 2
- Lecture 8 - How does the heart muscle work? - Part 1
- Lecture 9 - How does the heart muscle work? - Part 2
- Lecture 10 - Cardiac system : From stimuli to rhythmic muscle contraction - Part 1
- Lecture 11 - Cardiac system : From stimuli to rhythmic muscle contraction - Part 2
- Lecture 12 - Cardiac system : From stimuli to rhythmic muscle contraction - Part 3
- Lecture 13 - Cardiac system : From stimuli to rhythmic muscle contraction - Part 4
- Lecture 14 - Rhythmicity of heart beat - Part 1
- Lecture 15 - Rhythmicity of heart beat - Part 2
- Lecture 16 - Hemodynamics
- Lecture 17 - Hemodynamics and Regulation - Part 1
- Lecture 18 - Hemodynamics and Regulation - Part 2
- Lecture 19 - Hemodynamics and Regulation - Part 3
- Lecture 20 - Hemodynamics and Regulation - Part 4
- Lecture 21 - Hemodynamics and Regulation - Part 5
- Lecture 22 - Hemodynamics and Regulation - Part 6
- Lecture 23 - Lymphatic system
- Lecture 24 - Excretory system : Kidney - Part 1
- Lecture 25 - Excretory system : Kidney - Part 2
- Lecture 26 - Excretory system : Kidney - Part 3
- Lecture 27 - Kidney and RBC production
- Lecture 28 - Excretory system : Nephron - Part 1
- Lecture 29 - Excretory system : Nephron - Part 2

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

- Lecture 30 - Excretory system : Nephron - Part 2.1
- Lecture 31 - Excretory system : Nephron - Part 3
- Lecture 32 - Excretory system : Regulation of Osmolarity and counter-current mechanism - Part 1
- Lecture 33 - Excretory system : Regulation of Osmolarity and counter-current mechanism - Part 2
- Lecture 34 - Excretory system : Regulation of Osmolarity and counter-current mechanism - Part 3
- Lecture 35 - Physiology and Introduction of Respiration - Part 1
- Lecture 36 - Physiology and Introduction of Respiration - Part 2
- Lecture 37 - Respiration - Part 1
- Lecture 38 - Respiration - Part 2
- Lecture 39 - Respiration - Part 3
- Lecture 40 - Respiration - Part 4
- Lecture 41 - Physiology of smooth muscles and digestive system - Part 1
- Lecture 42 - Physiology of smooth muscles and digestive system - Part 2
- Lecture 43 - Physiology of smooth muscles and digestive system - Part 3
- Lecture 44 - Physiology of smooth muscles and digestive system - Part 4
- Lecture 45 - Secretory functions of alimentary tract - Part 1
- Lecture 46 - Secretory functions of alimentary tract - Part 2
- Lecture 47 - Secretory functions of alimentary tract and Pancreas - Part 1
- Lecture 48 - Secretory functions of alimentary tract and Pancreas - Part 2
- Lecture 49 - Secretory functions of Pancreas and liver
- Lecture 50 - Secretory functions of Liver and Gallbladder
- Lecture 51 - Introduction to Endocrine system
- Lecture 52 - Pituitary gland and growth hormone secretion - Part 1
- Lecture 53 - Pituitary gland and growth hormone secretion - Part 2
- Lecture 54 - Thyroid gland - Part 1
- Lecture 55 - Thyroid gland - Part 2
- Lecture 56 - Hormones of adrenal cortex - Part 1
- Lecture 57 - Hormones of adrenal cortex - Part 2
- Lecture 58 - Physiology of Glucocorticoids - Part 1
- Lecture 59 - Physiology of Glucocorticoids - Part 2
- Lecture 60 - Course Summary

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

NPTEL Video Course - Biotechnology - NOC:I Think Biology

Subject Co-ordinator - Prof. Kaustubh Rau, Prof. Sravanti Uppaluri, Prof. Divya Uma, Prof. Jayanti Ray Mukherjee

Co-ordinating Institute - Azim Premji University

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

Lecture 1 - What is Biology ?

Lecture 2 - Pillars of Biology

Lecture 3 - Biology and the City

Lecture 4 - The Process of Science

Lecture 5 - A Tale of Forgotten Scientists - Part I

Lecture 6 - A Tale of Forgotten Scientists - Part II

Lecture 7 - Numbers and Scales in Biology - Part I

Lecture 8 - Numbers and Scales in Biology - Part II

Lecture 9 - Experimentation vs Theory_Discussion

Lecture 10 - How to Find Reliable Information ?

Lecture 11 - How to Read a Scientific Article ?

Lecture 12 - Biomolecules - Part I

Lecture 13 - Biomolecules - Part II

Lecture 14 - Central Dogma

Lecture 15 - Gene Regulation

Lecture 16 - Non-Coding RNA

Lecture 17 - Introduction to Cells

Lecture 18 - Our Favourite Cells - Part I

Lecture 19 - Our Favourite Cells - Part II

Lecture 20 - Cell Cycle

Lecture 21 - Cell Cycle Control

Lecture 22 - Cancer Biology (Guest Lectuer) - Dr. Ramray Bhat (IISc)

Lecture 23 - Discussion on Cancer Biology - Dr. Ramray Bhat (IISc) and Dr. Divya Uma (Azim Premji University)

Lecture 24 - Genetics - I

Lecture 25 - Genetics - II

Lecture 26 - Genetics - III

Lecture 27 - Gene Mutations and Genetic Disorders (Guest Lectuer) Dr. Antara Das, Azim Premji University

Lecture 28 - Studying Human Genetic Disorders using Transgenic Animals - Research talk (Guest Lectuer)

Lecture 29 - Bead Microscopy (Guest Lectuer) Dr. Procheta Mallik (ISPF and ThinkTac)

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

- Lecture 30 - Molecular Biology Techniques
- Lecture 31 - Bacterial DNA Isolation and PCR - Hands-on (Guest Lectuer) Dr. Beena DB (Azim Premji University)
- Lecture 32 - BT Cotton - Part 1 (Case study)
- Lecture 33 - Molecular Biology Techniques - BT Cotton - Part 2 (Case study)
- Lecture 34 - Introduction to Evolution
- Lecture 35 - Evidences of Evolution
- Lecture 36 - Mechanism of Evolution
- Lecture 37 - Misconceptions about Evolution - Discussion
- Lecture 38 - Human Evolution
- Lecture 39 - Species, Speciation and Biodiversity - I
- Lecture 40 - Species, Speciation and Biodiversity - II
- Lecture 41 - Measuring Biodiversity (Tutorial)
- Lecture 42 - Speciation
- Lecture 43 - Speciation (Case studies)
- Lecture 44 - Introduction to Ecological Interactions - Part 1
- Lecture 45 - Ecological Interactions - Part 2
- Lecture 46 - Ecological Interactions - Part 3
- Lecture 47 - Mutualism - Figs (Case Study)
- Lecture 48 - Seed Dispersal (Case study)
- Lecture 49 - Introduction to Public Health (Guest Lectuer) Dr.Abha Rao (Public Health Foundation of India)
- Lecture 50 - Public Health in India (Guest Lectuer) Dr. Abha Rao (Public Health Foundation of India)
- Lecture 51 - Discussion on Public Health - Dr. Abha Rao (PHFI) and Mr. Pratush Brahma (University of Florida)
- Lecture 52 - Public Health - Rotavirus (Case study)
- Lecture 53 - Public Health - Malaria (Case study) - Part 1
- Lecture 54 - Public Health - Malaria (Case study) - Part 2
- Lecture 55 - Biology and Climate Change - Part 1
- Lecture 56 - Biology and Climate Change - Part 2
- Lecture 57 - Biology and Climate Change - Part 3
- Lecture 58 - Biodiversity Conservation (Guest Lectuer) Dr. Krishnapriya Tamma (Azim Premji University)
- Lecture 59 - Discussion on Biology and Society
- Lecture 60 - Discussion on Art and Science
- Lecture 61 - Biology and Society - Case study on Stray Dogs
- Lecture 62 - Nature Relatedness
- Lecture 63 - Course Wrap-Up

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

NPTEL Video Course - Biotechnology - NOC:Classics in Neuroscience

Subject Co-ordinator - Prof.Varadhan SKM

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - History of Neuroscience - Introduction - Part 1
- Lecture 2 - History of Neuroscience - Introduction - Part 2
- Lecture 3 - Factors that produce discoveries
- Lecture 4 - Importance of the 1950s in Neuroscience
- Lecture 5 - Advances in Molecular Biology (Genes to DNA)
- Lecture 6 - Discovery of the structure of the DNA
- Lecture 7 - How DNA works
- Lecture 8 - Molecular biology of the human brain
- Lecture 9 - Signaling molecule: The First growth Factor
- Lecture 10 - Nerve Growth Factor
- Lecture 11 - Organizing the Connections
- Lecture 12 - Axonal Transport
- Lecture 13 - Signaling molecules: The First Neurotransmitter in the brain
- Lecture 14 - The concept of Lock and Key
- Lecture 15 - The Soup vs Sparks Debate
- Lecture 16 - Intracellular Electrode, Neurotransmitter in the Brain, Dales Law
- Lecture 17 - Early evidence of Acetylcholine and Glutamate
- Lecture 18 - Early evidence of GABA and Serotonin
- Lecture 19 - Catecholamine and Hormones
- Lecture 20 - Second messengers and Hormones
- Lecture 21 - Pheromones
- Lecture 22 - Revolution in Cytology
- Lecture 23 - Synapse and the 'Neuronism vs Reticularism' debate
- Lecture 24 - Contributions by Rene Couteaux and George Koelle
- Lecture 25 - Chemical Synapse
- Lecture 26 - Synapse and the Neuromuscular Junction
- Lecture 27 - The Electrical Synapse and Myelin
- Lecture 28 - Physiology: The Action Potential - Part 1

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

- Lecture 29 - Recording nerve impulses and single action potentials
- Lecture 30 - Recording from nerve and plant cells
- Lecture 31 - Recording Local circuits, Hodgkin and Huxely contributions - Part 1
- Lecture 32 - Hodgkin and Huxely model - Part 2 and Kenneth Cole Contributions
- Lecture 33 - GHK equation and HH action potentials
- Lecture 34 - First Electrophysiological Evidence for Synaptic Transmission
- Lecture 35 - Bernard Katz
- Lecture 36 - End-Plate Potential and Synaptic Quanta
- Lecture 37 - Eccles and Spinal motor neuron
- Lecture 38 - Invertebrate simple systems: Aplysia
- Lecture 39 - Other studies of sensory responses
- Lecture 40 - Legacy of Golgi and Ramo`n y Cajal
- Lecture 41 - Dynamic polarization of Neuron
- Lecture 42 - Modern Research
- Lecture 43 - Synaptic Integration and Action Potential Initiation
- Lecture 44 - Active properties of dendrites
- Lecture 45 - Dendritic dominance
- Lecture 46 - Dendritic spines
- Lecture 47 - Rethinking the concept of Neuron Doctrine
- Lecture 48 - Muscle spindles
- Lecture 49 - Spinal cord pathways
- Lecture 50 - Retinal Processing
- Lecture 51 - Keffler Hartline
- Lecture 52 - Stephen Kuffler and Horace Barlow
- Lecture 53 - Expansion of the Reflex concept
- Lecture 54 - Central Pattern generators
- Lecture 55 - The cortical column
- Lecture 56 - Vernon Mountcastle
- Lecture 57 - Central Visual Processing
- Lecture 58 - Central Visual Processing and Feature Detectors
- Lecture 59 - Intracellular recordings from the brain - Part 1
- Lecture 60 - Intracellular recordings from the brain - Part 2
- Lecture 61 - Two motor systems
- Lecture 62 - Auditory cortex and The pattern theory of olfaction
- Lecture 63 - Arousal and Reticular activating system
- Lecture 64 - Sleep and Rapid Eye Movements
- Lecture 65 - Operant Conditioning by brain stimulation
- Lecture 66 - Hypothalamus and Feeding Behavior
- Lecture 67 - Brain as a gland

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

- Lecture 68 - Hypothalamic-Neurohypophyseal System
- Lecture 69 - Hypothalamic-Adenohypophyseal System
- Lecture 70 - Founding Modern Neuroanatomy
- Lecture 71 - Psychology and Ethology
- Lecture 72 - Karl Lashley
- Lecture 73 - Donald Hebb
- Lecture 74 - Limbic system-Limbic Lobe and Papez Circuit
- Lecture 75 - Limbic system-Kluver-Bucy Syndrome
- Lecture 76 - The Limbic system and Amygdala
- Lecture 77 - The Hippocampus and Patient H.M
- Lecture 78 - Brenda Milner
- Lecture 79 - Neurology: Foundations of Brain Imaging
- Lecture 80 - The Neurological unit of the Boston City Hospital
- Lecture 81 - Derek Denny-Brown, Raymond Adams and C. Miller Fisher
- Lecture 82 - Montreal Neurological Institute
- Lecture 83 - Cerebral Circulation
- Lecture 84 - Spreading depression of Leo and Migraine
- Lecture 85 - The Eradication of Polio
- Lecture 86 - Origin of Neurosurgery
- Lecture 87 - Harvey Cushing
- Lecture 88 - Pituitary Surgery
- Lecture 89 - Stereotaxy
- Lecture 90 - Epilepsy
- Lecture 91 - Psychosurgery
- Lecture 92 - Antipsychotic Drugs
- Lecture 93 - Reserpine
- Lecture 94 - Monoamine Oxidase Inhibitors
- Lecture 95 - Lithium
- Lecture 96 - Benzodiazepines
- Lecture 97 - Stress
- Lecture 98 - Theoretical Neuroscience: Brain as computer and Computer as Brain
- Lecture 99 - John Atanasoff
- Lecture 100 - John von Neumann
- Lecture 101 - Game and Information theory
- Lecture 102 - Cybernetics and Artificial Intelligence
- Lecture 103 - Towards Networks of Realistic Neurons: von Newman's Last word
- Lecture 104 - Santiago Ramon y Cajal, 'The Peasant Genius'
- Lecture 105 - 'Cajal- a giant wakes up'
- Lecture 106 - Cajal's modifications to the Golgi method and studies of embryos and various systems

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

- Lecture 107 - Law of dynamic polarization, support from others studies
- Lecture 108 - Santiago Ramon y Cajal - Career turning point and Palm Sunday years
- Lecture 109 - Cajal's trailblazing discoveries that earned him the Nobel Prize
- Lecture 110 - 'Enduring Legacy of Cajal'
- Lecture 111 - Robert Barany - Early life and prior work done by other scientists
- Lecture 112 - Robert Barany - The serendipitous discovery of the caloric test
- Lecture 113 - Robert Barany - Vestibular System and connection to Cerebellum
- Lecture 114 - Robert Barany - Modern Applications of Barany's work - Space medicine and Astronaut training
- Lecture 115 - Robert Barany - Summary of Contributions
- Lecture 116 - Charles Sherrington Personal Background
- Lecture 117 - Charles Sherrington - quiet mind expt, Neuroplasticity, animal locomotion studies
- Lecture 118 - Charles Sherrington - Reciprocal innervation, Pain and Emotion, Mind and Body
- Lecture 119 - Charles Sherrington's Magnum Opus - The integrative action of the nervous system
- Lecture 120 - Charles Sherrington - Insights into life and work by Molnar and Brown
- Lecture 121 - Charles Sherrington - Summary of contributions
- Lecture 122 - Edgar Adrian, Keith Lucas and Novel instruments used in Neurophysiology
- Lecture 123 - Edgar Adrian - Early life, All or none principle in neurons, Key findings with Keith Lucas
- Lecture 124 - Edgar Adrian - Work with Alexander Forbes, Gasser and Erlanger (St. Louis connection)
- Lecture 125 - Edgar Adrian - 'Failed experiment', Perseverance in science
- Lecture 126 - Edgar Adrian - Recording from single sensory and motor neurons
- Lecture 127 - Edgar Adrian - Nobel Prize, Admin work, Legacy
- Lecture 128 - Edgar Adrian - Adventures with EEG
- Lecture 129 - Edgar Adrian - Mapping cerebellar cortex, Cerebral cortex, Brain and Behavior, Olfaction
- Lecture 130 - Hodgkin and Huxley - Biographical background, Scientific backdrop and state of Neurophysiology
- Lecture 131 - Hodgkin and Huxley - Meeting of great minds and Challenges faced - Part 1
- Lecture 132 - Hodgkin and Huxley - Meeting of great minds and Challenges faced - Part 2
- Lecture 133 - Bernard Katz - personal background, scientific backdrop, soup vs spark debate
- Lecture 134 - Bernard Katz - Quantal nature of synaptic transmission, Vesicle hypothesis, foundational work
- Lecture 135 - Bernard Katz - del Castillo model of receptor activation, role of calcium in synapses, sodium
- Lecture 136 - Bernard Katz Paper: The fine structure of neuromuscular junction of the frog
- Lecture 137 - Roger Sperry - Personal Background, Split brain patients, Hemispheric specialization
- Lecture 138 - Roger Sperry: Split Brain patients and Dichotomous consciousness
- Lecture 139 - Roger Sperry: Unified consciousness and Behavioural differences in split brain patients,
- Lecture 140 - Roger Sperry, Gazzaniga's Interpreter theory, Impact on Psychology and Neuroscience, Nobel Prize
- Lecture 141 - Roger Sperry's Chemoaffinity hypothesis paper
- Lecture 142 - Roger Sperry paper 'Mentalism: Yes, Dualism: No'
- Lecture 143 - Jens Christian Skou Part 1 : The Story of Jens Christian Skou's life in science
- Lecture 144 - Jens Christian Skou: Sodium Potassium pump overview and Nobel Prize
- Lecture 145 - Jens Christian Skou: Paper - 'The Influence of Some Cations on an Adenosine Triphosphate

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

- Lecture 146 - Arvid Carlsson - Personal Background, Education and Early Career, Pivot, Nobel prize contribution
- Lecture 147 - Arvid Carlsson - History of L Dopa
- Lecture 148 - Arvid Carlsson - Antipsychotics, Dopamine hypothesis, Serotonin and SSRIs, Omeprazole
- Lecture 149 - Eric Kandel - Early life and nobel prize winning work
- Lecture 150 - Eric Kandel - Synaptic Plasticity
- Lecture 151 - Eric Kandel - Aplysia work, Short and long term memory and mechanisms
- Lecture 152 - Paul Greengard - The Phosphorylation Paradigm
- Lecture 153 - David Hubel and Torsten Wiesel - early life, education and collaboration
- Lecture 154 - Hubel and Wiesel - Effect of early visual deprivation on cortical function
- Lecture 155 - Hubel and Wiesel - Effect of visual misalignment on binocular integration
- Lecture 156 - Hubel and Wiesel - Limited capacity for recovery following early visual deprivation

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

NPTEL Video Course - Biotechnology - NOC:Advances in Omics

Subject Co-ordinator - Prof. Nagarjun Vijay

Co-ordinating Institute - IISER - Bhopal

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

- Lecture 1 - Introduction to Genomics - 1
- Lecture 2 - Introduction to Genomics - 2
- Lecture 3 - Advent of NGS
- Lecture 4 - Genome Assembly: Few Concepts and Terminology
- Lecture 5 - Genome Assembly Approaches
- Lecture 6 - Pyrosequencing
- Lecture 7 - Reversible Chain Termination Based Sequencing
- Lecture 8 - Ph Sequencing
- Lecture 9 - Sequencing by Ligation (Solid)
- Lecture 10 - Sequencing by Ligation (Complete Genomics)
- Lecture 11 - Other Short-Read Sequencing Technologies - Part 1
- Lecture 12 - Other Short-Read Sequencing Technologies - Part 2
- Lecture 13 - Long-Read Sequencing
- Lecture 14 - Single Molecule Long-Read Sequencing
- Lecture 15 - The Omics Data Avalanche
- Lecture 16 - Evolutionary Biology and Genomics
- Lecture 17 - Ancient Genomics
- Lecture 18 - Whole-Genome Duplication
- Lecture 19 - Tests of Selection
- Lecture 20 - Genomics in Experimental Evolution
- Lecture 21 - Making Sense of Genomic Sequences
- Lecture 22 - Transcriptomics: New Tools Leading to Deeper Insights
- Lecture 23 - Single Cell Transcriptomics and Beyond
- Lecture 24 - Proteomics: A Brief Introduction
- Lecture 25 - Protein Quantification
- Lecture 26 - Introduction to Linux for Omics
- Lecture 27 - The Linux Command Line Interface
- Lecture 28 - Using the CLI-1: NCBI Datasets
- Lecture 29 - Using the CLI-2: Short Read Archive Toolkit

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

- Lecture 30 - UCSC and IGV genome browsers
- Lecture 31 - Mega Omics Projects
- Lecture 32 - Genotype-Tissue Expression (GTEx)
- Lecture 33 - Encyclopedia of DNA Element (ENCODE)
- Lecture 34 - The Cancer Genome Atlas (TCGA)
- Lecture 35 - Eukaryotic Genome Sequencing Consortia
- Lecture 36 - The Postomics Era
- Lecture 37 - RNA-Seq Differential Expression Analysis
- Lecture 38 - Gene Loss and its Consequences
- Lecture 39 - Establishing Gene loss: Few Examples
- Lecture 40 - Course Summary

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

NPTEL Video Course - Biotechnology - NOC:Statistics for Biomedical Engineers

Subject Co-ordinator - Prof. Babji Srinivasan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Statistics - Motivation
- Lecture 2 - Statistics - Introduction
- Lecture 3 - Statistics: Definition and Terminology - Part I
- Lecture 4 - Statistics: Definition and Terminology - Part II
- Lecture 5 - Data: Primary vs Secondary
- Lecture 6 - Data: Quantitative vs Qualitative
- Lecture 7 - Data: Presentation
- Lecture 8 - Data: Static vs Dynamic
- Lecture 9 - Data: Box Plot and Spyder Graphs
- Lecture 10 - Data: Summarising Data
- Lecture 11 - Probability: Event and Sample space
- Lecture 12 - Probability: Mutually exclusive and Independent Events
- Lecture 13 - Probability: Random Variables
- Lecture 14 - Probability: Expectation of Random Variable
- Lecture 15 - Probability: Variance of Random Variable
- Lecture 16 - Probability Distribution: Binomial, Poisson, Bernoulli
- Lecture 17 - Probability Distribution: Normal Distribution
- Lecture 18 - Central Limit Theorem: Statement
- Lecture 19 - Central Limit Theorem: Illustration
- Lecture 20 - Confidence Interval
- Lecture 21 - Determining Sample Size
- Lecture 22 - Hypothesis Test: Introduction
- Lecture 23 - Hypothesis Test: Example
- Lecture 24 - Hypothesis: P value
- Lecture 25 - Hypothesis: Type 2 error
- Lecture 26 - Hypothesis: Chi square Distribution - Part 1
- Lecture 27 - Hypothesis: Chi square Distribution - Part 2
- Lecture 28 - Hypothesis: Probability Plots
- Lecture 29 - Hypothesis: Contingency Table Test

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

- Lecture 30 - Multivariate Hypothesis: Two Sample Test
- Lecture 31 - Multivariate Hypothesis: Paired T test
- Lecture 32 - Multivariate Hypothesis: Paired vs Unpaired Testing
- Lecture 33 - Multivariate Hypothesis: Two population variances
- Lecture 34 - Multivariate Hypothesis: Multiple Random Variables - Part 1
- Lecture 35 - Multivariate Hypothesis: Multiple Random Variables - Part 2
- Lecture 36 - Multivariate Hypothesis: Covariance and Correlation
- Lecture 37 - One Way ANOVA: Motivation and Assumptions
- Lecture 38 - One Way ANOVA: Fixed and Random effects Model
- Lecture 39 - One Way ANOVA: Derivation and Confidence Interval
- Lecture 40 - One Way ANOVA: Confidence Interval
- Lecture 41 - One Way ANOVA: Unbalanced Experiment and Residuals
- Lecture 42 - One Way ANOVA: Interpretation of Results
- Lecture 43 - Statistical Modeling: Introduction
- Lecture 44 - Statistical Modeling: Linear Regression Derivation
- Lecture 45 - Statistical Modeling: Linear Regression - Assumption and Residuals
- Lecture 46 - Statistical Modeling: Multi Linear Regression
- Lecture 47 - Statistical Modeling: Logistic Regression
- Lecture 48 - Statistical Modeling: Cross Entropy Loss
- Lecture 49 - Statistical Modeling: Gradient Descent
- Lecture 50 - Statistical Modeling: One Way Anova via Linear Regression
- Lecture 51 - Design Of Experiments: Randomised Complete Block Design - Part 1
- Lecture 52 - Design Of Experiments: Randomised Complete Block Design - Part 2
- Lecture 53 - RCBD: Math Formulation and Derivation
- Lecture 54 - RCBD: Necessity and Application
- Lecture 55 - Latin Square: Introduction
- Lecture 56 - Latin Square: Math and Formulation
- Lecture 57 - Graeco - Latin Square
- Lecture 58 - Interaction Among Variables
- Lecture 59 - Two-Way ANOVA: Introduction - Part 1
- Lecture 60 - Two-Way ANOVA: Introduction - Part 2
- Lecture 61 - Two-Way ANOVA: Math and Formulation
- Lecture 62 - Factorial Design: 2^2 Experiments
- Lecture 63 - Factorial Design: 2^k Experiments - Part 1
- Lecture 64 - Factorial Design: 2^k Experiments - Part 2
- Lecture 65 - Factorial Design: Blocking
- Lecture 66 - Introduction to Python Programming for Biomedical Engineers

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

NPTEL Video Course - Biotechnology - NOC:Advanced Fluorescence Microscopy and Image Processing

Subject Co-ordinator - Prof. Gunjan Mehta

Co-ordinating Institute - IIT - Hyderabad

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

- Lecture 1 - Introduction to Fluorescence Microscopy
- Lecture 2 - Introduction to Optics
- Lecture 3 - Design of a fluorescence microscope
- Lecture 4 - Fluorescent proteins, organic dyes, and protein labelling strategies
- Lecture 5 - LIVE Demonstration of the fluorescence microscope, its design and components
- Lecture 6 - 6D imaging, live cell imaging, time lapse imaging
- Lecture 7 - Quantifying protein dynamics using FRAP, FLIP, FRET
- Lecture 8 - LIVE Demonstration for 6D imaging of live cells on a Leica DMI8 inverted fluorescence microscope
- Lecture 9 - Types of Illumination Epi, TIRF, HILO, light sheet, two photon
- Lecture 10 - Confocal microscopy
- Lecture 11 - LIVE Demonstration of the Nikon N-SPARC confocal microscope
- Lecture 12 - Super-Resolution Microscopy (SIM, STED, STORM/PALM)
- Lecture 13 - Nanomaterials for fluorescence imaging
- Lecture 14 - Immunofluorescence IF and Immunohistochemistry IHC
- Lecture 15 - Fluorescence In Situ Hybridization FISH, RNA FISH
- Lecture 16 - LIVE Demonstration for immunofluorescence procedure
- Lecture 17 - Digital images and camera technologies for microscopy
- Lecture 18 - CCD, EMCCD, sCMOS Camera
- Lecture 19 - LIVE Demonstration for digital images and adjustments
- Lecture 20 - Basic operations of ImageJ/FIJI, montage preparation
- Lecture 21 - Image filtering and object segmentation
- Lecture 22 - Macros, intensity measurement, scale bar, time stamp, colocalization
- Lecture 23 - LIVE Demonstration of ImageJ/Fiji based image processing
- Lecture 24 - Single molecule imaging and tracking
- Lecture 25 - Optical tweezers and traction force microscopy
- Lecture 26 - LIVE Demonstration for single-molecule imaging under HILO illumination
- Lecture 27 - Spatial transcriptomics and proteomics RNAscope, MERFISH, CODEX
- Lecture 28 - High content imaging
- Lecture 29 - Designing a fluorescence microscopy experiment

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

NPTEL Video Course - Biotechnology - Cancer Biology

Subject Co-ordinator - Prof. Karunagaran

Co-ordinating Institute - IIT Madras

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

Lecture 1 - Molecular Basis of Cancer
Lecture 2 - Hallmarks of cancer
Lecture 3 - Theories of Carcinogenesis
Lecture 4 - Genes associated with cancer Oncogenes
Lecture 5 - Genes associated with cancer Tumor suppressor genes
Lecture 6 - Signal transduction - Part 1
Lecture 7 - Signal transduction - Part 2
Lecture 8 - Aberrations in signaling in cancer
Lecture 9 - Wnt and cytokine signaling in cancer
Lecture 10 - Apoptotic signaling
Lecture 11 - Pro and antiapoptotic factors in cancer
Lecture 12 - NF kB Signaling in cancer
Lecture 13 - Cervical Cancer
Lecture 14 - Cancer Therapy
Lecture 15 - Molecularly targeted therapies for cancer - Part 1
Lecture 16 - Molecularly targeted therapies for cancer - Part 2
Lecture 17 - Epigenetics and cancer - Part 1
Lecture 18 - Epigenetics and cancer - Part 2
Lecture 19 - Role of microRNAs in cancer - Part 1
Lecture 20 - Role of microRNAs in cancer - Part 2
Lecture 21 - Tumor immunology - Part 1
Lecture 22 - Tumor immunology - Part 2
Lecture 23 - Immune checkpoint inhibitors in cancer therapy
Lecture 24 - Hypoxia and cancer
Lecture 25 - DNA repair mechanisms and cancer - Part 1
Lecture 26 - DNA repair mechanisms and cancer - Part 2
Lecture 27 - Metastasis and epithelial mesenchymal transition
Lecture 28 - Cancer cell metabolism

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

NPTEL Video Course - Biotechnology - Reactive Species in Medical and Related Technologies

Subject Co-ordinator - Prof. GK Suraihkumar

Co-ordinating Institute - IIT Madras

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

- Lecture 1 - Course Introduction
- Lecture 2 - Reactive Species Introduction - 1
- Lecture 3 - RS types; Oxygen in the Earth's Atmosphere
- Lecture 4 - Oxygen, antioxidants and RS homeostasis
- Lecture 5 - Review on initial concepts; A suitable framework for analysis
- Lecture 6 - A suitable framework for analysis (Continued...)
- Lecture 7 - Analysis of RS reactions - Thermodynamics
- Lecture 8 - Analysis of RS reactions - Thermodynamics
- Lecture 9 - Analysis of RS reactions - Kinetics
- Lecture 10 - RS initiation reactions - Practical scenarios
- Lecture 11 - RS propagation reactions
- Lecture 12 - RS reactions - propagation, termination
- Lecture 13 - RS reactions rate constants
- Lecture 14 - RS measurement introduction
- Lecture 15 - RS measurement - fluorescence
- Lecture 16 - RS measurement - fluorescence (Continued...)
- Lecture 17 - RS measurement - fluorescence (Continued...), chemiluminiscence
- Lecture 18 - RS book first view; EPR spectroscopy; Game 1
- Lecture 19 - EPR spectroscopy basics
- Lecture 20 - EPR spectroscopy (Continued...)
- Lecture 21 - Biomarkers and review
- Lecture 22 - RS in cell signaling - Introduction
- Lecture 23 - RS in cell signaling - Bacterial systems
- Lecture 24 - RS in cell signaling - Mammalian systems and systemic effects
- Lecture 25 - Game class - 2
- Lecture 26 - RS in liquid phase oxygen supply (LPOS)
- Lecture 27 - RS in LPOS (Continued...)
- Lecture 28 - RS in LPOS discussion (Continued...)
- Lecture 29 - RS induction in bioreactor inocula for improved productivity

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

- Lecture 30 - General discussion; RS and other stresses
- Lecture 31 - RS and other stresses (Continued...)
- Lecture 32 - RS rhythms in microalgae
- Lecture 33 - RS in nano-bio-systems
- Lecture 34 - RS in cancer treatment and management
- Lecture 35 - Game class - 3
- Lecture 36 - RS module
- Lecture 37 - RS module discussion
- Lecture 38 - Course review - Part 1
- Lecture 39 - Course review - Part 2
- Lecture 40 - Student presentation - Sujithra
- Lecture 41 - Student presentation - Manisha
- Lecture 42 - Student presentation - Vikash
- Lecture 43 - Student presentation - Jayashree
- Lecture 44 - Student presentation - Lakshmanan
- Lecture 45 - Student presentation - Swati
- Lecture 46 - Student presentation - Ankita
- Lecture 47 - Student presentation - Ragavi
- Lecture 48 - Student presentation - Abhas, and concluding remarks

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

NPTEL Video Course - Biotechnology - NOC:Regeneration Biology

Subject Co-ordinator - Prof. Rajesh Ramachandran

Co-ordinating Institute - IISER Mohali

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

- Lecture 1 - Basics of Regeneration: Basics and Types
- Lecture 2 - Regeneration, Wound Healing and Scar Formation in Different Regenerative Capacity
- Lecture 3 - Regeneration: In Normal Life and Implications
- Lecture 4 - Tissue Regeneration: Mammalian Context
- Lecture 5 - Liver Regeneration: Signaling Events
- Lecture 6 - Liver Regeneration: Mechanistic Insights
- Lecture 7 - Regeneration: lessons from animal model Hydra
- Lecture 8 - Mechanisms of regeneration in Hydra
- Lecture 9 - Asexual Reproduction - Fragmentation, Morphallaxis, Epimorphosis, lessons from Hydra
- Lecture 10 - Mechanisms of regeneration in Planaria
- Lecture 11 - Planaria regeneration-polarity and gradient in regeneration
- Lecture 12 - Planaria regeneration: Neoblasts and organ formation and Species type and environment
- Lecture 13 - Position control genes and regeneration - Part A
- Lecture 14 - Position control genes and regeneration - Part B
- Lecture 15 - Progenitor targeting and ectopic organs
- Lecture 16 - Tissue dedifferentiation, cellular reprogramming into blastema Cellular types in regeneration. Ne
- Lecture 17 - Totipotency, pluripotency, multipotency and unipotency, in regeneration context
- Lecture 18 - Adult stem cells: Natural and induced and their roles in regeneration-zebrafish
- Lecture 19 - Common cellular events during regeneration, embryonic development, and cancer
- Lecture 20 - Epithelial to mesenchymal transition (EMT) and mesenchymal to epithelial transition (MET) in reg
- Lecture 21 - Organ regeneration: Basics with examples
- Lecture 22 - Zebrafish fin regeneration-in a brief
- Lecture 23 - Zebrafish heart regeneration-in a brief
- Lecture 24 - Zebrafish retina regeneration-in a brief
- Lecture 25 - Spinal cord and brain regeneration-Conclusive mechanisms of regeneration
- Lecture 26 - Cellular, Molecular and Genetic factors involved in retina regeneration
- Lecture 27 - Detailed mechanisms of fin regeneration
- Lecture 28 - Retina regeneration-importance of Shh signaling Roles of epigenetic factors and their involvemen
- Lecture 29 - Importance of regeneration associated gene induction events-Transcription activators and repress

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

- Lecture 30 - Roles of different cellular signaling in regeneration: Examples- Wnt signaling
- Lecture 31 - Different cellular signaling during regeneration-Overview
- Lecture 32 - Different cellular signaling during regeneration. Examples- Jak-STAT and Fgf signaling
- Lecture 33 - Different cellular signaling during regeneration-Egf, and Hippo signaling
- Lecture 34 - Roles of Delta-Notch signaling during regeneration
- Lecture 35 - Tgf-beta signaling during regeneration
- Lecture 36 - Organ regeneration: An overview
- Lecture 37 - Accessory limb model of regeneration: lessons from Axolotl and newt
- Lecture 38 - Nerve-dependent regeneration-Axolotl and Newt
- Lecture 39 - Roles of Histone deacetylases in regeneration of vertebrates like fishes and amphibians
- Lecture 40 - Dynamics of immune system in organ regeneration
- Lecture 41 - Extracellular matrix and its roles in tissue regeneration
- Lecture 42 - Induced pluripotency and roles of iPFs during tissue Hox genes and homeotic transformation
- Lecture 43 - Animal cloning: implications in regeneration
- Lecture 44 - Embryonic stem cells, cord blood stem cells and adult stem cells
- Lecture 45 - Ethics of stem cell research in regeneration studies, regenerative medicine and biotechnology
- Lecture 46 - Tissue engineering-Why and how?
- Lecture 47 - History of tissue engineering
- Lecture 48 - Different steps in tissue engineering
- Lecture 49 - Different aspects of organ culture
- Lecture 50 - Major challenges in tissue engineering in practice
- Lecture 51 - Tissue 3D printing and organ culture
- Lecture 52 - Importance of scaffolds in tissue engineering
- Lecture 53 - Stem cells for tissue engineering-Use of CRISPR-Cas9 for genome targeting
- Lecture 54 - Types of adult stem cells and trans-differentiation for tissue engineering
- Lecture 55 - Influence of niches and scaffolds on stem cells: An organ culture perspective
- Lecture 56 - The basics of regeneration put into practice in vitro
- Lecture 57 - Adhesion, migration and aggregation of stem cells
- Lecture 58 - Artificial, liver, kidney and urinary bladder for transplantation in patients
- Lecture 59 - Limbal stem cells and artificial cornea
- Lecture 60 - Xenotransplantation vs organ culture in practice
- Lecture 61 - Future implications of regeneration in mammals
- Lecture 62 - Future implications of Organ culture in patient care

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

NPTEL Video Course - Biotechnology - NOC:Biomedical Instrumentation

Subject Co-ordinator - Prof. Varadhan SKM

Co-ordinating Institute - IIT Madras

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

- Lecture 1 - Introduction To Measurements - Sensors and Transducers
- Lecture 2 - Examples and Characteristics of Sensors and Transducers
- Lecture 3 - Generalized measurement system - Characteristics of Measurement system - Part 1
- Lecture 4 - Generalized measurement system - Characteristics of Measurement system - Part 2
- Lecture 5 - Generalized measurement system - Characteristics of Measurement system - Part 3
- Lecture 6 - Overview of amplifiers and signal processing techniques
- Lecture 7 - Overview of Signal Processing Techniques - Filtering methods
- Lecture 8 - Introduction to basic biomedical sensor types and their principles
- Lecture 9 - Biomedical Sensor - Resistive sensor - Part 1
- Lecture 10 - Biomedical Sensor - Resistive sensor - Part 2
- Lecture 11 - Biomedical Sensor - Capacitive sensor - Part 1
- Lecture 12 - Biomedical Sensor - Capacitive sensor - Part 2
- Lecture 13 - Biomedical Sensor - Inductive sensor
- Lecture 14 - Biomedical Sensor - Piezoelectric sensor - Part 1
- Lecture 15 - Biomedical Sensor - Piezoelectric sensor - Part 2
- Lecture 16 - Biomedical Sensor - Electrochemical sensor
- Lecture 17 - Biomedical Sensor - Optical sensor
- Lecture 18 - Biomedical Sensor - Hall Effect sensor
- Lecture 19 - Introduction to Measurement of Pressure
- Lecture 20 - Measurement of Blood Pressure - Direct method - Part 1
- Lecture 21 - Measurement of Blood Pressure - Direct method - Part 2
- Lecture 22 - Measurement of Blood Pressure - Direct method - Part 3
- Lecture 23 - Measurement of Blood Pressure - Direct method - Part 4
- Lecture 24 - Measurement of Blood Pressure - Direct method - Part 5
- Lecture 25 - Measurement of Blood Pressure - Indirect method - Part 1
- Lecture 26 - Measurement of Blood Pressure - Indirect method - Part 2
- Lecture 27 - Measurement of Body Temperature - Part 1
- Lecture 28 - Measurement of Body Temperature - Part 2
- Lecture 29 - Measurement of Body Temperature - Part 3

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

- Lecture 30 - Introduction to flow and volume measurement
- Lecture 31 - Blood Flow Measurement - Ultrasonic method - Part 1
- Lecture 32 - Blood Flow Measurement - Ultrasonic method - Part 2
- Lecture 33 - Blood Flow Measurement - Ultrasonic method - Part 3
- Lecture 34 - Blood Flow Measurement - Ultrasonic method - Part 4
- Lecture 35 - Blood Flow Measurement - Ultrasonic method - Part 5
- Lecture 36 - Blood Flow Measurement - Thermal method
- Lecture 37 - Introduction to respiratory system and measurements - Part 1
- Lecture 38 - Introduction to respiratory system and measurements - Part 2
- Lecture 39 - Respiratory Volume Measurement - Part 1
- Lecture 40 - Respiratory Volume Measurement - Part 2
- Lecture 41 - Introduction to Cardiac Output Measurement
- Lecture 42 - Cardiac Output Measurement Techniques
- Lecture 43 - Origin of Biopotential - Part 1
- Lecture 44 - Origin of Biopotential - Part 2
- Lecture 45 - Introduction to Biopotential electrode - Part 1
- Lecture 46 - Introduction to Biopotential electrode - Part 2
- Lecture 47 - Introduction to Biopotential electrode - Part 3
- Lecture 48 - Introduction to Biopotential electrode - Part 4
- Lecture 49 - Introduction to Biopotential electrode - Part 5
- Lecture 50 - Types of Biopotential Electrode - Micro Electrodes
- Lecture 51 - Practical Hints and Recording issue in using Electrodes
- Lecture 52 - Types of Biopotential Electrode - Body-Surface Recording Electrodes
- Lecture 53 - Types of Biopotential Electrode - Internal Electrode
- Lecture 54 - Types of Biopotential Electrode - Electrode Array
- Lecture 55 - Summary of electrode theory
- Lecture 56 - Introduction to Bioelectricity
- Lecture 57 - Types of Biosignals - ECG - Part 1
- Lecture 58 - Types of Biosignals - ECG - Part 2
- Lecture 59 - Types of Biosignals - ECG - Part 3
- Lecture 60 - Types of Biosignals - ECG - Part 4
- Lecture 61 - Types of Biosignals - ECG - Part 5
- Lecture 62 - Introduction to Nervous System
- Lecture 63 - Types of Biosignal - EEG - Part 1
- Lecture 64 - Types of Biosignal - EEG - Part 2
- Lecture 65 - Types of Biosignal - EEG - Part 3
- Lecture 66 - Types of Biosignal - EEG - Part 4
- Lecture 67 - Types of Biosignal - EEG - Part 5
- Lecture 68 - Types of Biosignal - EMG - Part 1

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- Lecture 69 - Types of Biosignal - EMG - Part 2
- Lecture 70 - Types of Biosignal - EMG - Part 3
- Lecture 71 - Types of Biosignal - EMG - Part 4
- Lecture 72 - Types of Biosignal - EMG - Part 5
- Lecture 73 - Comparison of ECG vs EEG vs EMG
- Lecture 74 - Introduction to Physiology of Eye
- Lecture 75 - Types of Biosignal - ERG
- Lecture 76 - Types of Biosignal - EOG
- Lecture 77 - Biofeedback Instrumentation
- Lecture 78 - Types of Biosignal - PCG
- Lecture 79 - Digital Stethoscope
- Lecture 80 - Review of basic respiratory physiology
- Lecture 81 - Introduction to Ventilator
- Lecture 82 - Classification of Ventilator
- Lecture 83 - Operation of Ventilator
- Lecture 84 - Control Scheme for Ventilator
- Lecture 85 - Breathing Sequences in Ventilator
- Lecture 86 - Modes of Ventilation
- Lecture 87 - Maneuvers during Ventilation
- Lecture 88 - High Frequency Ventilation
- Lecture 89 - Circuitry of Ventilator
- Lecture 90 - Introduction to Human Heart
- Lecture 91 - Cardiac Pacemaker
- Lecture 92 - External Pacemaker
- Lecture 93 - Implantable Pacemaker - Part 1
- Lecture 94 - Implantable Pacemaker - Part 2
- Lecture 95 - Leads and Electrodes for Pacemakers
- Lecture 96 - Introduction to Cardiac Fibrillation
- Lecture 97 - Introduction to Defibrillator
- Lecture 98 - Defibrillators: Control Variables, Waveforms, and Electrode Placement
- Lecture 99 - External Defibrillator- Part 1
- Lecture 100 - External Defibrillator- Part 2
- Lecture 101 - External Defibrillator- Part 3
- Lecture 102 - Implantable Defibrillator - Part 1
- Lecture 103 - Implantable Defibrillator - Part 2
- Lecture 104 - Introduction to Cardioverter
- Lecture 105 - Fundamental Physiology of the Renal system
- Lecture 106 - Introduction to Dialysis
- Lecture 107 - Hemodialysis

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

- Lecture 108 - Dialysis - Dialyzing membrane, fluid and types of Dialyzer
- Lecture 109 - Hemodialysis Machine
- Lecture 110 - Physiology and disorders of oxygen transport
- Lecture 111 - Pulse oximeter

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

NPTEL Video Course - Biotechnology - NOC:Human Physiology (2025)

Subject Co-ordinator - Prof. Sudip Mukherjee

Co-ordinating Institute - IIT (BHU) Varanasi

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

- Lecture 1 - Human Physiology
- Lecture 2 - Human Anatomy
- Lecture 3 - Introduction to Cells, Structure and Functions of Cell
- Lecture 4 - Ion and Molecular Transport - I
- Lecture 5 - Ion and Molecular Transport - II
- Lecture 6 - Homeostasis and Diseases caused due to Malfunction of Cell Organelles
- Lecture 7 - Introduction to Hematology, Blood Components and Function
- Lecture 8 - Hemostasis
- Lecture 9 - Anticoagulation and Blood related diseases
- Lecture 10 - Blood grouping and Transfusion
- Lecture 11 - Lymph and Lymphatic Circulation
- Lecture 12 - Immune Mechanism of Blood and Lymph
- Lecture 13 - Anatomy of Heart, Heart Diseases and Electrical Activities
- Lecture 14 - Cardiac and Peripheral Circulation
- Lecture 15 - Blood Vessels and Capillary
- Lecture 16 - Anatomical Parts of Lungs and Function
- Lecture 17 - Mechanism of Respiration, Gas Transport
- Lecture 18 - Gas Transport and Lung Volume Capacities
- Lecture 19 - Carbon Monoxide Poisoning, Oximeter and Lung Diseases
- Lecture 20 - Structure and Functions of Endocrine Glands
- Lecture 21 - Glucose Homeostasis, Type I and Type II Diabetes
- Lecture 22 - Cell Therapy for Diabetes and Artificial Pancreas
- Lecture 23 - Blood Glucose Measurement, Therapies for Diabetes
- Lecture 24 - Thyroid Synthesis and Functions
- Lecture 25 - Disease of the Endocrine Gland
- Lecture 26 - Digestive System Anomy and Function
- Lecture 27 - Digestion and Absorption of Carbohydrate
- Lecture 28 - Digestion and Absorption of Proteins
- Lecture 29 - Digestion and Absorption of Lipids

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

- Lecture 30 - Digestive Disorder
- Lecture 31 - Bones
- Lecture 32 - Joints and Other Connective Tissues
- Lecture 33 - Different Types of Muscles
- Lecture 34 - Neuromuscular Transmission
- Lecture 35 - Disease Related to Skeletal system
- Lecture 36 - Introduction of Excretory System
- Lecture 37 - Glomerular Filtration
- Lecture 38 - Proximal Convolute Tubule
- Lecture 39 - Loop of Henles and Other Parts of Nephron
- Lecture 40 - Renal Control of Blood Pressure and Renal Disorder
- Lecture 41 - Male Reproductive Organs
- Lecture 42 - Spermatogenesis
- Lecture 43 - Female Reproductive Organs
- Lecture 44 - Ovarian Cycle - 1
- Lecture 45 - Ovarian Cycle - 2
- Lecture 46 - Menstrual Cycle and Hormonal Regulation
- Lecture 47 - Fertilization and Pregnancy
- Lecture 48 - Contraceptive and IVF
- Lecture 49 - Male Reproductive Health and Disease
- Lecture 50 - Female Reproductive Health and Disease
- Lecture 51 - Introduction to Nervous System
- Lecture 52 - Brain Structure and Function
- Lecture 53 - Structure and Functions of Spinal Cords, Cranial and Spinal Nerves
- Lecture 54 - Neuron and Nerve Structure and Function
- Lecture 55 - Nerve Injury and Repair
- Lecture 56 - Neurotransmission - 1
- Lecture 57 - Neurotransmission - 2
- Lecture 58 - Glial Cells and Blood Brain Barrier
- Lecture 59 - Introduction to Various Sensory Organs and Their Function
- Lecture 60 - Neurological Disorders

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

NPTEL Video Course - Biotechnology - NOC:Biological Engineering

Subject Co-ordinator - Prof. Abhishek Suresh Dhoble

Co-ordinating Institute - IIT (BHU) Varanasi

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

- Lecture 1 - Introduction to the Subject and Course Plan
- Lecture 2 - Introduction to Microbial World
- Lecture 3 - Basic of Microbial Matabolism
- Lecture 4 - Importance of Microbes
- Lecture 5 - Microbial Products
- Lecture 6 - Cell Constiuents and Growth
- Lecture 7 - Microbial Growth
- Lecture 8 - Microbial Growth Quantification
- Lecture 9 - Aerobic vs Anaerobic Cultivation Methods
- Lecture 10 - Numerical Practice
- Lecture 11 - Microbial Growth Model
- Lecture 12 - Microbial Growth Model and Parameters Estimation - Part 1
- Lecture 13 - Microbial Growth Model and Parameters Estimation - Part 2
- Lecture 14 - Yield and Maintenance Coefficients
- Lecture 15 - Tutorial
- Lecture 16 - Plant Cell Culture - Part I
- Lecture 17 - Plant Cell Culture - Part II
- Lecture 18 - Animal Cells
- Lecture 19 - Animal Cell Culture
- Lecture 20 - Numerical Practice
- Lecture 21 - Animal Cells and Cell Lines
- Lecture 22 - Cell Sorting Method - Part I
- Lecture 23 - Cell Sorting Method - Part II
- Lecture 24 - Methods of Transfection
- Lecture 25 - Numerical Practice
- Lecture 26 - Introductory Immunology
- Lecture 27 - Immune Cells and Responses
- Lecture 28 - Isolation of Immune Cells
- Lecture 29 - Advanced Characterization of Immune Cells

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

- Lecture 30 - Numerical Practice
- Lecture 31 - Principles of Force, Motion and Energy in Biological Systems
- Lecture 32 - Static and Dynamic Analysis of Biological Systems
- Lecture 33 - Biomechanics of Bacterial Systems
- Lecture 34 - Case Study on Human Motion Biomechanics
- Lecture 35 - Numerical Practice on Applications of Biomechanics
- Lecture 36 - Introduction to Fluid Mechanics
- Lecture 37 - Advanced Fluid Mechanics in Biological Systems
- Lecture 38 - Case Study Blood Flow Through the Cardiovascular System
- Lecture 39 - Case Study Flow in the Lungs
- Lecture 40 - Numerical on Biological Fluid Mechanics
- Lecture 41 - Sterilization in Bioprocesses
- Lecture 42 - Sterilization Charts
- Lecture 43 - Practical Issues in Sterilization
- Lecture 44 - Kinetics of Thermal Sterilization
- Lecture 45 - Numerical Practice
- Lecture 46 - Bioreactor Configurations and Operating Considerations
- Lecture 47 - Chemostat with Recycle
- Lecture 48 - Multiple Chemostat, Fed batch and Perfusion Systems
- Lecture 49 - Gaden and Deindoefer Classification of Product Formation
- Lecture 50 - Numerical on Chemostat with Recycle and Fed Batch Operation
- Lecture 51 - Oxygen Uptake in Cell Cultures
- Lecture 52 - Oxygen Transfer Rate OTR vs Oxygen Uptake Rate OUR
- Lecture 53 - DO Effect
- Lecture 54 - Oxygen Supply and Transfer
- Lecture 55 - Numerical
- Lecture 56 - Mass Transfer Fundamentals
- Lecture 57 - Rheology of Biological Fluids
- Lecture 58 - Biological Wastewater Treatment Case Study
- Lecture 59 - Case Study Related to Hematopoiesis i Bioreactor Systems
- Lecture 60 - Numerical on Mass Transfer Coefficient, Rheologic Properties of Fluids and Anaerobic Digestion

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

NPTEL Video Course - Biotechnology - NOC:An Introduction to Evolutionary Biology

Subject Co-ordinator - Prof. Sutirth Dey

Co-ordinating Institute - IISER Pune

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

- Lecture 1 - Introduction to the Living World and two major questions
- Lecture 2 - History of Evolutionary Thought (Pre-Darwin)
- Lecture 3 - Making of Darwinism (External Video)
- Lecture 4 - Darwinism
- Lecture 5 - Beyond Darwinism: Modern Synthesis_EES
- Lecture 6 - Tying it all up_Back to the two questions
- Lecture 7 - Evidence for evolution 1: Change and Speciation
- Lecture 8 - Evidence for evolution 2: Descent with modification - Part 1
- Lecture 9 - Evidence for evolution 3: Descent with modification - Part 2
- Lecture 10 - Evidence for evolution 4: Objections to evolution
- Lecture 11 - Classifying variation
- Lecture 12 - Revising Mendel and introducing population genetics
- Lecture 13 - From family to the population
- Lecture 14 - Solving simple Hardy-Weinberg problems
- Lecture 15 - Generating variation
- Lecture 16 - Features of Mutations - Part 1
- Lecture 17 - Features of Mutations - Part 2
- Lecture 18 - Non-genetic Inheritance
- Lecture 19 - Introduction to Selection
- Lecture 20 - Dynamics of Selection 1: Numerical Simulations
- Lecture 21 - Dynamics of Selection 2: Analytical
- Lecture 22 - Features of selection: Insights from theory
- Lecture 23 - Examples of selection
- Lecture 24 - Features of selection: Insights from experiments
- Lecture 25 - Finite population: Numerical Simulations
- Lecture 26 - Genetic drift: examples and features
- Lecture 27 - Effective population size and evolution of mutation rates
- Lecture 28 - Non-random mating and inbreeding
- Lecture 29 - Migration: Numerical simulations and analysis

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

- Lecture 30 - Migration: Interactions and examples
- Lecture 31 - Introduction to Aging
- Lecture 32 - Mechanistic Theories of Aging
- Lecture 33 - Evolutionary Theories of Aging - Part 1
- Lecture 34 - Evolutionary Theories of Aging - Part 2
- Lecture 35 - Why sex?
- Lecture 36 - Benefits of sex
- Lecture 37 - Sexual Selection - Part 1
- Lecture 38 - Sexual Selection - Part 2
- Lecture 39 - Kin Selection and Hamilton's Rule
- Lecture 40 - Evolutionary Conflicts
- Lecture 41 - What is a species?
- Lecture 42 - What are the isolation mechanisms?
- Lecture 43 - Evolution of reproductive isolation
- Lecture 44 - How new genes are born
- Lecture 45 - Coping with changing environments
- Lecture 46 - Evolutionary patterns in the genome
- Lecture 47 - Origin of Life - Part 1
- Lecture 48 - Origin of Life - Part 2
- Lecture 49 - Human Evolution
- Lecture 50 - Applications of Evolution - Part 1
- Lecture 51 - Applications of Evolution - Part 2

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

NPTEL Video Course - Biotechnology - NOC:Cell Signaling

Subject Co-ordinator - Prof. Ram Kumar Mishra

Co-ordinating Institute - IISER Bhopal

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

- Lecture 1 - What is Signaling ?
- Lecture 2 - Why do we need signaling ?
- Lecture 3 - Types of Cell Signaling
- Lecture 4 - Signals: Nature and Composition
- Lecture 5 - Consequences of Signaling in context of Signal
- Lecture 6 - Types of Receptors and their functioning
- Lecture 7 - Modes of regulation on signaling (Receptors, Signals, and Effectors)
- Lecture 8 - G-proteins, and Kinase activity regulation in Signaling
- Lecture 9 - Phosphorylation-dependent regulation in Signaling
- Lecture 10 - Kinase activity assessment, Types of Kinases, and Signaling system of Microbial world
- Lecture 11 - Signaling by Two-component System
- Lecture 12 - Canonical and Hybrid Two-component system in Bacteria Life style changes
- Lecture 13 - The two-component system coordinates various microbial responses
- Lecture 14 - The two-component system coordinates sporulation and quorum sensing responses
- Lecture 15 - The two-component Signaling in plants
- Lecture 16 - The Cytokinin Signaling, TCS and plant development
- Lecture 17 - The two-component Signaling in Ethylene, photomorphogenic, and diurnal responses
- Lecture 18 - Receptor Serine-Threonine Kinase Signaling
- Lecture 19 - Different modes of RLK Signaling in plants
- Lecture 20 - Receptor-Like Kinase (RLK) Signaling shaping plants
- Lecture 21 - Signaling in animal world: Receptor Serine/Threonine kinase pathway
- Lecture 22 - Receptor Serine/Threonine kinase pathways and Bone morphogenesis
- Lecture 23 - Activin and AMH signaling through receptor Serine/Threonine kinase pathway
- Lecture 24 - Receptor Tyrosine Kinases (RTK)
- Lecture 25 - Activation of Receptor Tyrosine Kinases and their recognition
- Lecture 26 - JAK-STAT pathway and Phosphoinositides-dependent Receptor Tyrosine Kinase Signaling
- Lecture 27 - Phosphoinositides-dependent Signaling downstream of RTK activation
- Lecture 28 - Contact-mediated bidirectional Receptor Tyrosine Kinase Signaling
- Lecture 29 - Contact-mediated Eph-Ephrin Signaling shapes tissue organization

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

- Lecture 30 - Contact-mediated Signaling by Notch-Delta combination
- Lecture 31 - Integrin Signaling for cell motility, movement, and growth
- Lecture 32 - G-protein coupled receptor (GPCR): the basics and uniqueness
- Lecture 33 - G-protein coupled receptor mediated signaling pathways - I
- Lecture 34 - G-protein coupled receptor mediated signaling pathways - II
- Lecture 35 - G-protein coupled receptor mediated signaling pathways - III
- Lecture 36 - Regulation of Signaling at receptor level
- Lecture 37 - Signaling by Channel-type receptors
- Lecture 38 - Water Channels and nuclear/cytosolic receptors
- Lecture 39 - Nuclear receptors with TF activity, and signaling co-receptors
- Lecture 40 - A Snapshot and brief summary of the Cell Signaling

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

NPTEL Video Course - Biotechnology - NOC:Mass Spectrometry and its Application in Molecular Medicine

Subject Co-ordinator - Prof. Amit Kumar Mandal

Co-ordinating Institute - IISER Kolkata

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

- Lecture 1 - Introduction to soft ionisation mass spectrometry: ESI-MS and MALDI-MS
- Lecture 2 - Isotopic distribution of signals in mass spectra and deconvolution of mass spectra
- Lecture 3 - Resolution of mass spectra, accuracy in mass measurement and introduction of molecular medicine
- Lecture 4 - Mass spectra of human hemoglobin and glycated hemoglobin, a diagnostic marker of diabetes mellitus
- Lecture 5 - Mass spectrometry based quantification of oxidative stress in patients with chronic renal failure
- Lecture 6 - Introduction to tandem mass spectrometry and principle of de novo sequencing
- Lecture 7 - Chemical modification and enzyme digestion of a peptide: A step towards de novo sequencing
- Lecture 8 - De novo sequencing of a peptide from chemical derivatization and tandem mass spectra
- Lecture 9 - De novo sequencing: Identification of isobaric amino acid and disulfide connectivity
- Lecture 10 - De novo sequencing of a tryptic peptide from tandem mass spectra
- Lecture 11 - De novo sequencing from tandem-MS and SPITC derivatization to simplify tandem-MS
- Lecture 12 - Routine diagnosis of Hemoglobinopathy: A disease caused by genetic variant of hemoglobin
- Lecture 13 - Hemoglobinopathies: Identification and characterisation using bottom up proteomics approach - Pa
- Lecture 14 - Hemoglobinopathies: Identification and characterisation using bottom up proteomics approach - Pa
- Lecture 15 - A genetic variant of hemoglobin causing false elevation of HbA1c and hence false diagnosis of di
- Lecture 16 - Nano-LC-ESI-MS based analysis of a proteome - A bottom up proteomics approach
- Lecture 17 - Iron salts as food fortificants to combat Iron Deficiency Anemia
- Lecture 18 - Nano ferric pyrophosphate as a food fortificant in a rat model: Bioavailability and toxicity ass
- Lecture 19 - Nano ferric pyrophosphate as a food fortificant in a rat model: Toxicity assessment using bioche
- Lecture 20 - Nano ferric pyrophosphate as a food fortificant in a rat model: Exploring biomarker of nano part
- Lecture 21 - Biomarker of nano particles induced toxicity in a rat model: NanoLC-ESI-MS based plasma proteomi
- Lecture 22 - Quantitative proteomics of rat plasma proteins: Absolute quantification of Fetuin B, a biomarker
- Lecture 23 - 2D gel electrophoresis based proteomics: principles and methods
- Lecture 24 - Differential plasma proteomics: 2D gel electrophoresis based approach
- Lecture 25 - Analysis of 2D gel spots followed by in-gel digestion to identify proteins usng MALDI-MS platfor
- Lecture 26 - Mass spectrometry based absolute quantification of human plasma proteins
- Lecture 27 - Absolute quantification of plasma Apolipoprotein-AIV: A probale biomarker of attempted suicide
- Lecture 28 - MALDI-MS based identification of microorganism in clinical samples
- Lecture 29 - Native mass spectrometry using nano-ESI-MS platform

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

- Lecture 30 - Analysis of an array of glycated hemoglobin in patients with poorly controlled diabetes mellitus
- Lecture 31 - Molecular mechanism of sickle hemoglobin polymerisation
- Lecture 32 - Inhibition of sickle hemoglobin polymerisation upon glutathionylation
- Lecture 33 - Structural analysis of desorbed hemoglobin from nano particle surface
- Lecture 34 - Functional assay of human hemoglobin and its variants
- Lecture 35 - Application of native mass spectrometry to calculate equilibrium constant
- Lecture 36 - Bioconjugation of para-benzoquinone of cigarette smoke with human hemoglobin
- Lecture 37 - Bioconjugation of human hemoglobin with quinone as airborne environment pollutants
- Lecture 38 - Ion mobility mass spectrometry
- Lecture 39 - Introduction to hydrogen-deuterium-exchange mass spectrometry
- Lecture 40 - Rate law of hydrogen-deuterium-exchange kinetics
- Lecture 41 - Molecular insights in inhibition of HbS polymerisation upon oxygenation monitored by HDX-MS platform
- Lecture 42 - Molecular insights in inhibition of HbS polymerisation upon oxygenation monitored by HDX-MS platform
- Lecture 43 - Molecular insights in inhibition of HbS polymerisation upon oxygenation - Part III - and upon glutathionylation
- Lecture 44 - Molecular insights in inhibition of HbS polymerisation upon glutathionylation - Part II
- Lecture 45 - N-acetyl cysteine as an antisickling agent in sickle cell disease
- Lecture 46 - Effect of quinones on morphology of human RBC
- Lecture 47 - Effect-of-NAC-to naturalise-quinone-and-in-vivo-HDX with human RBCs as a model system
- Lecture 48 - Application of HDX-MS in structural analysis of human hemoglobin in vivo
- Lecture 49 - Application of HDX-MS in structural analysis of hemoglobin in vivo-and-desorbed-hemoglobin from nano particle surface
- Lecture 50 - Application-of-HDX-MS-and -CD-spectroscopy-to-monitor-structural changes-of human hemoglobin from nano particle surface
- Lecture 51 - Structure-function correlation of Hb Beckman, a genetic variant of human hemoglobin, using HDX-MS
- Lecture 52 - Structure-function correlation of glutathionyl hemoglobin, a posttranslational variant of human hemoglobin
- Lecture 53 - Imaging mass spectrometry of biological tissue samples using MALDI mass spectrometry platform
- Lecture 54 - Kidney tissue imaging in a nano particle exposed rat model
- Lecture 55 - Imaging of kidney tissues of NP exposed rats and imaging of human prostate tissue
- Lecture 56 - Imaging of human prostate cancer tissue using MALDI-MS
- Lecture 57 - Imaging of human prostate cancer tissue using MALDI-MS and analysis of tissue proteomics data
- Lecture 58 - Desorption Electrospray Ionisation based Mass Spectrometric Imaging of Prostate Cancer Tissue
- Lecture 59 - Fast photochemical oxidation of protein combined to mass spectrometry for protein footprinting
- Lecture 60 - Biosimilar-monitored through mass spectrometric techniques

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

NPTEL Video Course - Biotechnology - NOC:Introduction to Cardiovascular Mechanics

Subject Co-ordinator - Prof. Anand Mohan

Co-ordinating Institute - IIT Hyderabad

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

Lecture 1 - Course Overview
Lecture 2 - Basics of Continuum Mechanics
Lecture 3 - Review of Course Overview
Lecture 4 - Review of Continuum Mechanics
Lecture 5 - Heart - Part 1
Lecture 6 - Heart - Part 2
Lecture 7 - Review of Heart - Part 1
Lecture 8 - Review of Heart - Part 2
Lecture 9 - Blood - Part 1
Lecture 10 - Blood - Part 2
Lecture 11 - Review of Blood - Part 1
Lecture 12 - Review of Blood - Part 2
Lecture 13 - Vasculature
Lecture 14 - Review of Vasculature

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

NPTEL Video Course - Biotechnology - NOC:Polymeric Biomaterials: Structure, Properties, Function and Performance

Subject Co-ordinator - Prof. Satyavrata Samavedi

Co-ordinating Institute - IIT Hyderabad

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

Lecture 1 - Course Introduction: Structure, Properties, Function and Performance

Lecture 2 - Biomaterials Over the Years

Lecture 3 - Biocompatibility, Bioactivity, Biodegradation, Biomimicry

Lecture 4 - Biomaterials - A Device Perspective

Lecture 5 - Overview of Polymeric Biomaterials

Lecture 6 - Definition of - mer, Monomer, Oligomer and Polymer

Lecture 7 - Molecular Structure and Configuration

Lecture 8 - Molar Mass and Dispersity

Lecture 9 - Chain Conformation and Structural Characteristics

Lecture 10 - Polymer Architecture and Organization

Lecture 11 - Polymer Synthesis

Lecture 12 - Polymer Crystallinity and Melting

Lecture 13 - Amorphous State and Glass Transition

Lecture 14 - Polymer Solutions

Lecture 15 - Solution Thermodynamics

Lecture 16 - Overview of Flory-Huggins Theory

Lecture 17 - Synthetic Biomedical Polymers - 1

Lecture 18 - Synthetic Biomedical Polymers - 2

Lecture 19 - Natural Biomedical Polymers - 1

Lecture 20 - Natural Biomedical Polymers - 2

Lecture 21 - Hydrogels

Lecture 22 - Mechanical Properties and Responses - 1

Lecture 23 - Mechanical Properties and Responses - 2

Lecture 24 - Viscoelastic Responses

Lecture 25 - Overview of Linear Viscoelastic Models

Lecture 26 - Degradation of Polymeric Biomaterials

Lecture 27 - Biomaterial Processing Methods and Design Considerations

Lecture 28 - Polymer Electrospinning - Concepts

Lecture 29 - Polymer Electrospinning - Lab Demonstration

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

- Lecture 30 - Biomaterial Surfaces, ECM Interactions and Surface Modification
- Lecture 31 - Protein Adsorption on Biomaterial Surfaces
- Lecture 32 - Blood Interactions with Biomaterial Surfaces
- Lecture 33 - Biomaterial Implantation and the Host Response
- Lecture 34 - Biocompatibility, Medical Devices, Translation and Regulation

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

NPTEL Video Course - Biotechnology - NOC:Animal Transgenesis: Principles and Methods

Subject Co-ordinator - Prof. Himanshu Kumar

Co-ordinating Institute - IISER Bhopal

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

Lecture 1 - Common terms used in the course

Lecture 2 - Why transgenesis is needed ?

Lecture 3 - Model organisms for transgenesis

Lecture 4 - 3R Replace Reduce Refine

Lecture 5 - History of transgenesis - I

Lecture 6 - History of transgenesis - II

Lecture 7 - General Principles of Transgenesis in Mouse

Lecture 8 - History of Cell culture

Lecture 9 - Cell culture Types and Basic Requirements

Lecture 10 - Culture medium and Challenges with cell culture

Lecture 11 - Methods for internalization of transgene, and Cell Preservation and Generation of transgene over

Lecture 12 - Cell for transgenesis and Homologous recombination

Lecture 13 - Targeting vector

Lecture 14 - ES cells, Electroporation, Screening, and Founder or Chimera mice

Lecture 15 - Germline transmission and Conditional knockout mice

Lecture 16 - Example of conditional knockout mice and Temporal control of gene expression

Lecture 17 - Discovery, origin and Types of CRISPR-Cas9 System

Lecture 18 - CRISPR-Cas9 sgRNA and its modifications for gene editing

Lecture 19 - CRISPR-Cas9 version and its application

Lecture 20 - Genome-wide CRISPR-Cas9 screening and its variants application

Lecture 21 - CRISPR-Cas9 in therapeutics

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

NPTEL Video Course - Biotechnology - Analytical Technologies in Biotechnology

Subject Co-ordinator - Dr. Ashwani K. Sharma

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Basic concepts in microscopy - 1
- Lecture 2 - Basic concepts in microscopy - 2
- Lecture 3 - Dark-field and phase contrast microscopy
- Lecture 4 - Differential interference contrast and polarization
- Lecture 5 - Fluorescence and confocal microscopy
- Lecture 6 - Transmission electron microscopy
- Lecture 7 - Transmission electron microscopy cont. and scanning electron microscopy
- Lecture 8 - Basic concepts - 1
- Lecture 9 - Basic concepts - 2
- Lecture 10 - GM counting and Scintillation counting
- Lecture 11 - Scintillation counting continued
- Lecture 12 - Autoradiography and RIA
- Lecture 13 - Safety aspects and applications
- Lecture 14 - Introduction and Basic concepts in chromatography - 1
- Lecture 15 - Basic concepts in chromatography - 2
- Lecture 16 - Low-pressure liquid chromatography (LPLC) and high performance liquid chromatography (HPLC)
- Lecture 17 - Ion-exchange chromatography
- Lecture 18 - Gel-filtration chromatography
- Lecture 19 - Affinity chromatography
- Lecture 20 - Gas-liquid chromatography
- Lecture 21 - Basic concepts in electrophoresis
- Lecture 22 - Horizontal and vertical gel electrophoresis
- Lecture 23 - Native gel electrophoresis and SDS-PAGE
- Lecture 24 - Isoelectric focusing (IEF), 2-D gel electrophoresis and protein detection methods
- Lecture 25 - Electrophoresis of nucleic acids
- Lecture 26 - Immunoelectrophoresis and capillary electrophoresis
- Lecture 27 - Introduction and Basic Concepts - 1
- Lecture 28 - Basic concepts - 2
- Lecture 29 - Types of centrifuges and analytical ultracentrifugation method

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- Lecture 30 - Separation methods in preparative ultracentrifuges
- Lecture 31 - Types of rotors
- Lecture 32 - Types of rotors cont. and care of rotors
- Lecture 33 - Introduction and basic concepts
- Lecture 34 - UV-Visible spectroscopy
- Lecture 35 - Infrared and fluorescence spectroscopy
- Lecture 36 - Circular dichroism (CD) spectroscopy
- Lecture 37 - Nuclear magnetic resonance (NMR) spectroscopy and X-ray crystallography
- Lecture 38 - Atomic spectroscopy and mass spectrometry
- Lecture 39 - Polymerase chain reaction(PCR)
- Lecture 40 - DNA sequencing methods
- Lecture 41 - Enzyme linked immunosorbent assay (ELISA)

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

NPTEL Video Course - Biotechnology - NOC:Biomedical Nanotechnology

Subject Co-ordinator - Prof. P.Gopinath

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction to Nano

Lecture 2 - Nano-Biomimicry

Lecture 3 - Synthesis of nanomaterials by Physical and Chemical Methods

Lecture 4 - Synthesis of nanomaterials by Biological Methods

Lecture 5 - Characterisation of Nanomaterials

Lecture 6 - DNA Nanotechnology

Lecture 7 - Protein and Glyco Nanotechnology

Lecture 8 - Lipid Nanotechnology

Lecture 9 - Bio-Nanomachines

Lecture 10 - Carbon nanotubes and Its Bio-Applications

Lecture 11 - Nanomaterials for Cancer Diagnosis

Lecture 12 - Nanomaterials for Cancer therapy

Lecture 13 - Nanotechnology in Tissue Engineering

Lecture 14 - Nano artificial cells

Lecture 15 - Nanotechnology in Organ Printing

Lecture 16 - Nanotechnology in Point-of-Care Diagnostics

Lecture 17 - Nano-Pharmacology and Drug Targeting

Lecture 18 - Cellular uptake mechanisms of nanomaterials

Lecture 19 - In vitro Methods to study antibacterial and anticancer properties of nanomaterials

Lecture 20 - Nanotoxicology

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

NPTEL Video Course - Biotechnology - NOC:Plant Developmental Biology

Subject Co-ordinator - Prof. Shri Ram Yadav

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Life Cycle of an Angiosperm
- Lecture 2 - Characteristics of Plant Growth and Development - I
- Lecture 3 - Characteristics of Plant Growth and Development - II
- Lecture 4 - Molecular Genetics of Plant Development - I
- Lecture 5 - Molecular Genetics of Plant Development - II
- Lecture 6 - Molecular Genetics of Plant Development - III
- Lecture 7 - Molecular Genetics of Plant Development - IV
- Lecture 8 - Molecular Genetics of Plant Development (Continued...) - I
- Lecture 9 - Molecular Genetics of Plant Development (Continued...) - II
- Lecture 10 - Molecular Genetics of Plant Development (Continued...) - III
- Lecture 11 - Root Development
- Lecture 12 - Root Development (Continued...)
- Lecture 13 - Root Development (Vascular Development)
- Lecture 14 - Root Branching
- Lecture 15 - Shoot Development
- Lecture 16 - Shoot Development
- Lecture 17 - Shoot Development
- Lecture 18 - Shoot Development
- Lecture 19 - Cell-Cell Communication During Plant Development
- Lecture 20 - Techniques Used in Lab

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

NPTEL Video Course - Biotechnology - NOC:Structural Biology

Subject Co-ordinator - Prof. Saugata Hazra

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction: Why to Study Structural Biology

Lecture 2 - Introduction to Biological Macromolecules

Lecture 3 - Introduction: Decoding Biological Macromolecules

Lecture 4 - Introduction: Genome Sequencing

Lecture 5 - Introduction: Post Genomic Era

Lecture 6 - Amino acids and their properties

Lecture 7 - Protein: Protein Chemistry, Chirality, Peptide bond and Levels of protein structures

Lecture 8 - Protein: Dihedral angles, Peptide bond and Ramachandran Plot

Lecture 9 - Protein: Super Secondary Structures, Motif, Domains, Non-covalent interactions

Lecture 10 - Protein: Folding of Protein, Thermodynamics and Kinetics of protein folding, Characterization of

Lecture 11 - Introduction to Structural Biology Techniques - Part I

Lecture 12 - Introduction to Structural Biology Techniques - Part II

Lecture 13 - X-ray Crystallography: Crystallization - Part I

Lecture 14 - X-ray Crystallography: Crystallization - Part II

Lecture 15 - X-ray Crystallography: Crystal Mounting

Lecture 16 - X-ray Crystallography: Production of X-ray and its properties

Lecture 17 - X-ray Crystallography: Journey to 3D land

Lecture 18 - X-ray Crystallography: Crystal Symmetry

Lecture 19 - X-ray Crystallography: Instrumentation in X-ray Crystallography

Lecture 20 - X-ray Crystallography: Data collection and processing

Lecture 21 - X-ray Crystallography: Data Analysis - Part I

Lecture 22 - X-ray Crystallography: Data Analysis - Part II

Lecture 23 - X-ray Crystallography: Phase Problem - Part I

Lecture 24 - X-ray Crystallography: Phase Problem - Part II

Lecture 25 - X-ray Crystallography: Refinement and Structure deposition to PDB

Lecture 26 - Introduction to Spectroscopy and NMR

Lecture 27 - Basic Principles of NMR and Instrumentation

Lecture 28 - NMR Sample Preparation and Chemical Shift related concepts

Lecture 29 - Factors effecting NMR Spectra (1D and 2D)

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- Lecture 30 - 2D and 3D NMR Spectroscopy focusing on protein structure
- Lecture 31 - Introduction to Spectroscopy
- Lecture 32 - UV-Vis and CD spectroscopy
- Lecture 33 - Fluorescence Spectroscopy and Green Fluorescence Protein (GFP)
- Lecture 34 - Infrared and Raman Spectroscopy for protein
- Lecture 35 - Raman Spectroscopy, Raman Microscopy and Raman Crystallography for studying protein
- Lecture 36 - Introduction to Microscopy
- Lecture 37 - Functioning details of Cryo Electron Microscopy (Cryo EM)
- Lecture 38 - Cryo Electron Microscopy: Data Collection and Analysis
- Lecture 39 - A concise story of advancement Cryo-EM
- Lecture 40 - Protein Data Bank
- Lecture 41 - History of Molecular Visualizations of Biological Macromolecules
- Lecture 42 - Description of structure related files (.pdb, .mmcif, .mtz, etc.)
- Lecture 43 - Demonstration of COOT
- Lecture 44 - 3D visualization using Pymol
- Lecture 45 - Demonstration of Pymol
- Lecture 46 - Why we need MD Simulation
- Lecture 47 - Molecular Dynamic Simulation Process - Part I
- Lecture 48 - Molecular Dynamic Simulation Process - Part II
- Lecture 49 - Molecular Dynamic Simulation Process - Part III
- Lecture 50 - Application of Molecular Dynamic Simulation
- Lecture 51 - What, How and Which of Protein Engineering
- Lecture 52 - How to make logical Protein Engineering: Process of Rational design
- Lecture 53 - Success story of Rational Protein designing: Focusing on De Novo Process
- Lecture 54 - Designing Protein by mimicking nature: Process of Directed Evolution
- Lecture 55 - Achievement, Challenges, and Future direction in the field of Protein Engineering
- Lecture 56 - Introduction to Structure Based Drug Discovery (SBDD)
- Lecture 57 - Rational Drug Discovery
- Lecture 58 - Docking Based Virtual Screening: Progress, Challenges and Future perspective
- Lecture 59 - What makes a small molecule an ideal drug: Developing in silico ADMETox Model
- Lecture 60 - Structure Based Drug Discovery: Case study and Conclusion

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

NPTEL Video Course - Biotechnology - NOC:Experimental Nanobiotechnology

Subject Co-ordinator - Prof. P. Gopinath

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Synthesis of Nanomaterials Using Ball Milling
- Lecture 2 - Synthesis Of Gold Nanoparticles
- Lecture 3 - Biological Synthesis of Nanomaterials
- Lecture 4 - Synthesis Of Carbon Dots
- Lecture 5 - Synthesis Of Polymeric Nanoparticles
- Lecture 6 - UV-Visible and Fluorescence Spectroscopy
- Lecture 7 - Dynamic Light Scattering and Zeta Potential Analysis
- Lecture 8 - Fourier Transform Infrared Spectroscopy
- Lecture 9 - X-Ray Diffraction
- Lecture 10 - Electron Microscopy
- Lecture 11 - Atomic Force Microscopy
- Lecture 12 - Electrochemical Nano-Biosensor
- Lecture 13 - Fabrication of Nanofibers Using Electrospinning
- Lecture 14 - Synthesis of Hydrogel and Nanogel
- Lecture 15 - In vitro 3D Cell Culture
- Lecture 16 - 3D Bioprinting
- Lecture 17 - In vitro Methods to Study Antibacterial Properties of Nanomaterials
- Lecture 18 - In vitro Cytotoxicity Analysis
- Lecture 19 - In vitro Methods to Study the Apoptotic Potential of Nanomaterials
- Lecture 20 - In vitro Hemocompatibility Test
- Lecture 21 - In vivo Toxicity Studies Using Zebrafish Embryo

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NPTEL Video Course - Biotechnology - NOC:Learning about Learning: A Course on Neurobiology of Learning and Me

Subject Co-ordinator - Prof. Balaji Jayaprakash

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction to Learning and Memory - I

Lecture 2 - Introduction to Learning and Memory - II

Lecture 3 - Associative Learning I

Lecture 4 - Associative learning II

Lecture 5 - Introduction to the Rescorla Wagner Model

Lecture 6 - Application of Rescorla Wagner Model - I

Lecture 7 - Application of Rescorla Wagner Model - II

Lecture 8 - Application of Rescorla Wagner Model - III

Lecture 9 - Application of Rescorla Wagner Model - IV

Lecture 10 - Limitations of Rescorla Wagner Model

Lecture 11 - Introduction of Reinforcement Learning - I

Lecture 12 - Introduction of Reinforcement Learning - II

Lecture 13 - Introduction of Reinforcement Learning - III

Lecture 14 - Sign Tracking vs Goal Oriented/Tracking; Linking complex behaviors to simple molecules

Lecture 15 - Sign Tracking vs Goal Oriented; Learning Linking complex behaviors to simple molecules - II

Lecture 16 - Memory in Molecular Terms - I

Lecture 17 - Memory in Molecular Terms - II

Lecture 18 - Memory in Molecular Terms - III

Lecture 19 - Memory in Molecular Terms - IV

Lecture 20 - Memory in Molecular Terms - V

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NPTEL Video Course - Biotechnology - NOC:Drug Delivery: Principles and Engineering

Subject Co-ordinator - Rachit Agarwal

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Drug Delivery Introduction and Pharmacokinetics
- Lecture 2 - Pharmacokinetics (Continued...)
- Lecture 3 - Pro-drugs and Polymers Introduction
- Lecture 4 - Polymers - Synthesis
- Lecture 5 - Polymers - Properties
- Lecture 6 - Biomedical Polymers
- Lecture 7 - Biodegradable Polymers and Polymer Drug Conjugates - I
- Lecture 8 - Polymer Drug Conjugates - II
- Lecture 9 - Research Paper Discussion and Diffusion Controlled Systems
- Lecture 10 - Controlled Release
- Lecture 11 - Controlled Release
- Lecture 12 - Controlled Release
- Lecture 13 - Math Exercise
- Lecture 14 - Hydrogels - I
- Lecture 15 - Hydrogels - II
- Lecture 16 - Hydrogels - III
- Lecture 17 - Hydrogels - IV
- Lecture 18 - Nano and Micro-particles - I
- Lecture 19 - Nano and Micro-particles - II
- Lecture 20 - Nano and Micro-particles - III
- Lecture 21 - Nano and Micro-particles - IV
- Lecture 22 - Nano and Micro-particles - V
- Lecture 23 - Nano and Micro-particles - VI
- Lecture 24 - Nano and Micro-particles - VII
- Lecture 25 - Protein Adsorption - I
- Lecture 26 - Protein Adsorption - II
- Lecture 27 - Protein Adsorption - III
- Lecture 28 - Tissue Engineering - I
- Lecture 29 - Tissue Engineering - II

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- Lecture 30 - Tissue Engineering - III
- Lecture 31 - Drug Delivery in Tissue Engineering - I
- Lecture 32 - Drug Delivery in Tissue Engineering - II
- Lecture 33 - Implant Associated Infections - I
- Lecture 34 - Implant Associated Infections - II
- Lecture 35 - Route Specific Delivery
- Lecture 36 - Route Specific Delivery
- Lecture 37 - Route Specific Delivery
- Lecture 38 - Route Specific Delivery
- Lecture 39 - Route Specific Delivery
- Lecture 40 - Route Specific Delivery
- Lecture 41 - Route Specific Delivery
- Lecture 42 - Research Paper Discussion
- Lecture 43 - Route Specific Delivery
- Lecture 44 - Intravenous Administration
- Lecture 45 - Immune System - II
- Lecture 46 - Complement System and Blood Clotting
- Lecture 47 - Blood Clotting and Hemocompatibility of Materials; Adaptive Immune Response
- Lecture 48 - Adaptive Immune Response and Vaccine
- Lecture 49 - Vaccines
- Lecture 50 - Vaccines and Immuno-isolated Cell Therapy
- Lecture 51 - Immuno-isolated Cell Therapy
- Lecture 52 - Immuno-isolated Cell and Gene Therapy
- Lecture 53 - Gene Delivery
- Lecture 54 - Gene Delivery
- Lecture 55 - Genes as Vaccines
- Lecture 56 - Vaccines
- Lecture 57 - Cancer Vaccines
- Lecture 58 - Cancer Vaccine
- Lecture 59 - Responsive Delivery Systems - I
- Lecture 60 - Responsive Delivery Systems - II
- Lecture 61 - Targeted Drug Delivery System
- Lecture 62 - Targeted Drug Delivery System
- Lecture 63 - Nanotoxicology and Translation Pathways

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

NPTEL Video Course - Biotechnology - NOC:Fundamentals of Micro and Nanofabrication

Subject Co-ordinator - Prof. Shankar Selvaraja

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction

Lecture 2 - Substrate

Lecture 3 - Substrate (Continued...)

Lecture 4 - Introduction to cleanroom

Lecture 5 - Contamination and surface cleaning

Lecture 6 - Advanced cleaning techniques

Lecture 7 - Defects

Lecture 8 - Diffusion

Lecture 9 - Diffusion - Advanced Concepts

Lecture 10 - Ion Implantation

Lecture 11 - Ion Implantation (Continued...)

Lecture 12 - Native Films

Lecture 13 - Native Films

Lecture 14 - Native Films

Lecture 15 - Methods and Some Definitions

Lecture 16 - Chemical Vapor Deposition

Lecture 17 - Chemical Vapor Deposition

Lecture 18 - Chemical Vapor Deposition

Lecture 19 - Chemical Vapor Deposition

Lecture 20 - Chemical Vapor Deposition

Lecture 21 - Atomic Layer Deposition

Lecture 22 - Atomic Layer Deposition (Continued...)

Lecture 23 - Physical Vapor Deposition

Lecture 24 - Physical Vapor Deposition

Lecture 25 - Physical Vapor Deposition

Lecture 26 - Metallization

Lecture 27 - Metallization

Lecture 28 - Pattern Transfer Basics

Lecture 29 - Optical lithography basics

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

- Lecture 30 - Optical lithography basics
- Lecture 31 - Optical Lithography
- Lecture 32 - Optical Lithography
- Lecture 33 - Projection Lithography
- Lecture 34 - Projection Lithography
- Lecture 35 - Optical lithography
- Lecture 36 - Optical Lithography
- Lecture 37 - Lithography process technology glossary
- Lecture 38 - Optical Lithography
- Lecture 39 - Electron beam lithography
- Lecture 40 - Electron beam lithography
- Lecture 41 - Emerging lithography techniques
- Lecture 42 - Etching Figures of Merit
- Lecture 43 - Wet etching Basics
- Lecture 44 - Wet Etching Recipes
- Lecture 45 - Wet Etching Recipes
- Lecture 46 - Dry etch
- Lecture 47 - Dry etch
- Lecture 48 - Dry etch
- Lecture 49 - Dry etch
- Lecture 50 - Dry etch
- Lecture 51 - Chemical Mechanical Polishing (CMP)
- Lecture 52 - Chemical Mechanical Polishing (CMP)
- Lecture 53 - Design for Manufacturability - 1
- Lecture 54 - Design for Manufacturability - 2
- Lecture 55 - Design for Manufacturability
- Lecture 56 - Process integration
- Lecture 57 - PV integration
- Lecture 58 - CMOS integration
- Lecture 59 - Lab demo
- Lecture 60 - Lab demo
- Lecture 61 - CMOS process for photonics application

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

NPTEL Video Course - Biotechnology - NOC:Optical Spectroscopy and Microscopy: Fundamentals of Optical Measure

Subject Co-ordinator - Prof. Balaji Jayaprakash

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Optical Focus and Localisation of Light
- Lecture 2 - Relating Photon's Momentum to Spot Size
- Lecture 3 - Shortest Pulse of Light
- Lecture 4 - Behaviour of light through polarizers
- Lecture 5 - Nature of Light
- Lecture 6 - Revisiting Polarisation Through Ket Vectors
- Lecture 7 - Light through Polarisers
- Lecture 8 - Light through Polarisers
- Lecture 9 - Time Dependent Perturbation Theory (TDPT)
- Lecture 10 - TDPT in Steps-1
- Lecture 11 - TDPT in Steps-2
- Lecture 12 - TDPT in Steps-3
- Lecture 13 - Fermi's Golden Rule
- Lecture 14 - Beer Lambert's Law from TDPT
- Lecture 15 - Einstein's Phenomenology
- Lecture 16 - Einstein's Coefficients, Fluorescence and Lifetime
- Lecture 17 - Fock States and Photonic Treatment of Light
- Lecture 18 - Operators in Fock State Space
- Lecture 19 - Light Matter Interaction and Rudimentary Feynman Diagrams
- Lecture 20 - Emergence of Spontaneous and Stimulated Emission Processes
- Lecture 21 - Lecture 21
- Lecture 22 - Lecture 22
- Lecture 23 - Lecture 23
- Lecture 24 - Lecture 24
- Lecture 25 - Lecture 25
- Lecture 26 - Introduction to LASER
- Lecture 27 - LASER population dynamics
- Lecture 28 - LASER population dynamics - Part- 2
- Lecture 29 - Real world LASER and characteristics of LASER emission

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

- Lecture 30 - Temporal and Spatial Coherence
- Lecture 31 - Transverse and Longitudinal modes of LASER
- Lecture 32 - Pulsed LASER
- Lecture 33 - Q-switching in detail
- Lecture 34 - Q-switching in detail - Part 2
- Lecture 35 - Basics of mode locking
- Lecture 36 - Basics of mode locking - Part 2
- Lecture 37 - Pulse compression
- Lecture 38 - Real world system (Mode lock Part-2)
- Lecture 39 - TEM mode
- Lecture 40 - Alignment basics
- Lecture 41 - Non-Linear Optics
- Lecture 42 - Confocal Detection
- Lecture 43 - Interference Filters
- Lecture 44 - Laser Scanning System - 1
- Lecture 45 - Laser Scanning System - 2
- Lecture 46 - Alignment of Moving Beams
- Lecture 47 - Decoding an Objective Lens - 1
- Lecture 48 - Decoding an Objective Lens - 2
- Lecture 49 - Designing Lens Systems
- Lecture 50 - Astigmatism and Field Curvature
- Lecture 51 - Intro to Lab Session
- Lecture 52 - Optics in LAB
- Lecture 53 - Optics in Lab
- Lecture 54 - Kinematic Mounts
- Lecture 55 - Alignment with out iris
- Lecture 56 - Fluorescence Spectrometer - 1
- Lecture 57 - Fluorescence Spectrometer - 2
- Lecture 58 - Ti

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

NPTEL Video Course - Biotechnology - NOC:Cell Biology: Cellular Organization, Division and Processes

Subject Co-ordinator - Prof. Shikha Laloraya

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction to Cell Biology, Cell components, organization and processes - Part I
Lecture 2 - Introduction to Cell Biology, Cell components, organization and processes - Part II
Lecture 3 - DNA: The genetic material - Part I
Lecture 4 - DNA: The genetic material - Part II
Lecture 5 - Regulation of the cell cycle - Part I
Lecture 6 - Regulation of the cell cycle - Part II
Lecture 7 - Checkpoints: The DNA damage and DNA replication checkpoints
Lecture 8 - The Ubiquitin Proteasome system
Lecture 9 - S-phase: Regulation of entry into S-phase and DNA Replication
Lecture 10 - DNA replication - Part I
Lecture 11 - DNA Replication - Part II
Lecture 12 - DNA Replication - Part III
Lecture 13 - DNA Replication - Part IV
Lecture 14 - Mitosis - Part I
Lecture 15 - Cytokinesis
Lecture 16 - Aging and Senescence
Lecture 17 - Apoptosis - Part I
Lecture 18 - Apoptosis - Part II
Lecture 19 - Meiosis - Part I
Lecture 20 - Meiosis - Part II
Lecture 21 - Nuclear organization
Lecture 22 - SMC proteins and chromosome organization - Real-Time imaging of DNA loop-extrusion by SMC complex
Lecture 23 - The cohesin complex and its functions - The mysterious biological function of chromosome loops
Lecture 24 - Chromatin organization
Lecture 25 - SMC proteins and chromosome organization - Introduction
Lecture 26 - Meiosis - Part III
Lecture 27 - Mitosis - Part II
Lecture 28 - Cell diversity and properties of specialized cells-Budding yeast as a model system
Lecture 29 - The Plant Cell

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- Lecture 30 - Stem cells - Part I Intro-SL
- Lecture 31 - Stem cells - Part II
- Lecture 32 - Nerve cells
- Lecture 33 - The Cancer Cell

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

NPTEL Video Course - Biotechnology - NOC:Microsensors, Implantable Devices and Rodent Surgeries for Biomedical

Subject Co-ordinator - Prof. Shabari Girishan K V, Prof. Hardik J. Pandya

Co-ordinating Institute - RUAS IISc - Bangalore

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

- Lecture 1 - Course Introduction - I
- Lecture 2 - Course Introduction - II
- Lecture 3 - Neuro anatomy for Neurosurgery
- Lecture 4 - Neural Implant Fabrication: PVD - I
- Lecture 5 - Neural Implant Fabrication: PVD - II
- Lecture 6 - Rodent Neuroanatomy
- Lecture 7 - Basics of BCI and Signal Processing
- Lecture 8 - Neural Implant Fabrication: Sputtering and CVD
- Lecture 9 - Principles of Stereotactic Rodent MicroNeurosurgery
- Lecture 10 - Neural Signal Processing: Demonstrations
- Lecture 11 - Neural Implant Fabrication: Photolithography - I
- Lecture 12 - Neural Implant Fabrication: Photolithography - II
- Lecture 13 - Craniotomy and Stereotactic Implantation Surgeries
- Lecture 14 - Lithography Numericals
- Lecture 15 - IDE Patterning
- Lecture 16 - Etching
- Lecture 17 - Introduction to Cleanroom and Gowning
- Lecture 18 - E-Beam Evaporation Demonstration
- Lecture 19 - Craniotomy and Cranial Window Surgeries
- Lecture 20 - Flexible MEA: Introduction and Process Flow
- Lecture 21 - Flexible MEA: EIB, Characterization and Analyses
- Lecture 22 - Stereotactic Implantation Surgeries
- Lecture 23 - Sputtering Demonstration
- Lecture 24 - 3D Printing - Part I
- Lecture 25 - Bioresorbable Microelectrode Array-based System
- Lecture 26 - Fundamentals of Spinal Neuroanatomy
- Lecture 27 - 3D Printing - Part II
- Lecture 28 - Neural Implant - Microneedle
- Lecture 29 - Spinal Cord Structure, and Circuits

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- Lecture 30 - Surgical Steps in Spinal Surgeries
- Lecture 31 - 3D Printing - Part III
- Lecture 32 - 3D Printing - Demonstration
- Lecture 33 - Wet Etching Demonstration
- Lecture 34 - Neural Implants for Parkinson's Disease
- Lecture 35 - Spinal micro neuro Surgery
- Lecture 36 - Anesthesia in Rodents
- Lecture 37 - Physiological Monitoring in Rodents
- Lecture 38 - Lithography Demonstration
- Lecture 39 - Electronic System Development for Neural Engineering - I
- Lecture 40 - Anesthesia Administration Equipments and Vital Monitoring
- Lecture 41 - Standard Safety Practices
- Lecture 42 - Euthanasia
- Lecture 43 - Euthanasia in Rodents
- Lecture 44 - Electronic System Development for Neural Engineering - II
- Lecture 45 - Rodent Brain and Spinal Cord Harvest
- Lecture 46 - Rodent Behavioural Setups
- Lecture 47 - Study Plan for Behavioural Setups: Stroke Model
- Lecture 48 - PCB Design Demonstration for Neural Systems
- Lecture 49 - Electronic Systems for Brain Stimulation - I
- Lecture 50 - Behavioural Tasks in Rodent Models - I
- Lecture 51 - Behavioural Tasks in Rodent Models - II
- Lecture 52 - Behavioural Setup for Rodents: Parkinsonism Model - I
- Lecture 53 - Behavioural Setup for Rodents: Parkinsonism Model - II
- Lecture 54 - Electronic Systems for Brain Stimulation - II
- Lecture 55 - Course Concluding Remarks

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

NPTEL Video Course - Biotechnology - NOC:Fundamentals of Cryo-Electron Microscopy (Cryo-EM) and 3D Image Proc

Subject Co-ordinator - Prof. Somnath Dutta

Co-ordinating Institute - IISc Bangalore

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

- Lecture 1 - Introduction of the microscope
- Lecture 2 - Image formation by glass lenses and its role in wavelength
- Lecture 3 - Different components of electron microscope (EM)
- Lecture 4 - Electron specimen interaction
- Lecture 5 - Elements of TEM: electron gun - I
- Lecture 6 - Elements of TEM: electron gun - II
- Lecture 7 - Comparison between the various types of electron gun
- Lecture 8 - Elements of TEM: electromagnetic lens (EM) - I
- Lecture 9 - Trajectory of electrons in EM lens
- Lecture 10 - Elements of TEM: electromagnetic lens (EM) - II
- Lecture 11 - Image Formation by EM Lenses: Understanding Ray Diagrams
- Lecture 12 - Aberrations and Focusing in Cryo-EM imaging
- Lecture 13 - Understanding Chromatic, Spherical Aberrations, and Astigmatism in Cryo-EM
- Lecture 14 - Aberrations and Practical Imaging in Cryo-EM
- Lecture 15 - Electron Dose Control and Beam Optimization in Cryo-EM
- Lecture 16 - Introduction to TEM Holders and Grids in Cryo-EM
- Lecture 17 - Overfocused and Underfocused Images
- Lecture 18 - Elements of TEM: Pumps in EM System
- Lecture 19 - Elements of TEM: Detectors in EM System
- Lecture 20 - Imaging and Effect of Thermal Drift
- Lecture 21 - Wave and its properties
- Lecture 22 - Addition/superposition of waves - I
- Lecture 23 - Addition/superposition of waves - II
- Lecture 24 - Decomposition of complex waves
- Lecture 25 - Wave and their transformation
- Lecture 26 - Complex 2D Images and Its Diffraction Pattern
- Lecture 27 - Sample Preparation and Determination for TEM
- Lecture 28 - Biological Sample Purification - I
- Lecture 29 - Biological Sample Purification - II

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- Lecture 30 - Different Sample Preparation Techniques for TEM Imaging and Different Types of Grids used for Im
- Lecture 31 - TEM Grids: Types, Handling and Surface Coatings
- Lecture 32 - Carbon Coaters, Glow Discharge and Grid Surface Treatment
- Lecture 33 - Negative Staining in TEM: Stains, Grid Preparation and Protocols
- Lecture 34 - Carbon Sandwich and Metal Shadowing Techniques in TEM
- Lecture 35 - Staining Quality in TEM: Thick, Thin and Positive Staining
- Lecture 36 - Negative Staining - Imaging Quality and Artifacts
- Lecture 37 - Negative Staining - Particle Distribution and Contrast
- Lecture 38 - Applications of Negative Staining in Structural Biology
- Lecture 39 - Negative Staining for Complexes and Interactions
- Lecture 40 - Ultramicrotomy and Sectioning for Biological Molecules
- Lecture 41 - Cryo-EM Grid Preparation and Vitrification
- Lecture 42 - Grid Types and Sample Distribution in Cryo-EM
- Lecture 43 - Blotting Parameters and Ice Conditions
- Lecture 44 - Motion Correction and Defocus in Cryo-EM
- Lecture 45 - Microscope Alignment and Imaging Limitations
- Lecture 46 - CTF Estimation and Defocus in Cryo-EM
- Lecture 47 - Phase Flip and Motion Correction
- Lecture 48 - High Pressure and Rapid Freezing Methods
- Lecture 49 - Cryo-Ultra Microtomy and FIB-SEM
- Lecture 50 - Graphene Oxide Grids in Cryo-EM
- Lecture 51 - Motion Correction and 2D Classification Basics
- Lecture 52 - Concepts and Methods in 2D/3D Classification
- Lecture 53 - 3D Reconstruction and Resolution Assessment
- Lecture 54 - Practical: TEM Setup and Negative Staining
- Lecture 55 - Practical: Cryo-EM Plunge Freezing
- Lecture 56 - Practical: Cryo-EM Grid Clipping
- Lecture 57 - Practical: Grid Loading and Imaging Software