

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
Lecture 16
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Lecture 29

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Lecture 30
Lecture 31
Lecture 32
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Lecture 39
Lecture 40

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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

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

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

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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 dysregulation 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

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

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

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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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NPTEL 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 research
- 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

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
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
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Lecture 24
Lecture 25
Lecture 26
Lecture 27
Lecture 28
Lecture 29

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Lecture 30
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Lecture 46
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Lecture 57
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Lecture 59
Lecture 60
Lecture 61

Subject Co-ordinator - Prof. Rupal Dalal

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

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

NPTEL Video Course - 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 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

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

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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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

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

Lecture 30 - Bio electricity
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

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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- 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 Route 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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- 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

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

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

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

- 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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- 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

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

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

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

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

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

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

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

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 Application

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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- 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 Activity
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 Morris-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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- 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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- 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 Systems

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

- 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

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

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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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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Lecture 69 - Demo

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

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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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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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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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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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 Struture Activity Relationship (QSAR)
Lecture 26 - Quantitative Struture Activity Relationship (QSAR)
Lecture 27 - Quantitative Struture Activity Relationship (QSAR)
Lecture 28 - Quantitative Struture Activity Relationship (QSAR)
Lecture 29 - Quantitative Struture Activity Relationship (QSAR)

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

- 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. Suraishkumar, 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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NPTEL 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{I}^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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NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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

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

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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- Lecture 30 - Fatty acid catabolism - Part 2
- Lecture 31 - Fatty Acid Biosynthesis
- Lecture 32 - Cholestrol Biosynthesis and Lipid transport - Part 1
- Lecture 33 - Cholestrol 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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- 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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NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

- 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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- 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 Econstruction 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 Expres
- 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 Annotati
- 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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- 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 Cousteaux 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 Newmann
- 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 - 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

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

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

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

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

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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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

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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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- 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

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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