

# 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  
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Lecture 27  
Lecture 28  
Lecture 29

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

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

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

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

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

Lecture 1 - Introduction to amino acids

Lecture 2 - Introduction to proteins

Lecture 3 - Protein folding & misfolding

Lecture 4 - Protein purification techniques

Lecture 5 - Introduction to proteomics

Lecture 6 - Systems biology and proteomics

Lecture 7 - Sample preparation and pre-analytical factors

Lecture 8 - Sample preparation

Lecture 9 - Sample preparation

Lecture 10 - One-dimensional electrophoresis

Lecture 11 - 2-DE

Lecture 12 - 2-DE

Lecture 13 - 2-DE

Lecture 14 - 2-DE

Lecture 15 - 2-DE

Lecture 16 - 2D-DIGE

Lecture 17 - 2D-DIGE

Lecture 18 - 2D-DIGE

Lecture 19 - Protein identification using MALDI-TOF/TOF

Lecture 20 - Proteomics experiment data analysis & challenges

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

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

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

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

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

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

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

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

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

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



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

NPTEL Video Course - Biotechnology - NOC:Introduction to Proteomics

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction to amino acids

Lecture 2 - Introduction to proteins

Lecture 3 - Protein folding and misfolding

Lecture 4 - Introduction to proteomics

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

Lecture 6 - Sample preparation and pre-analytical factors

Lecture 7 - Sample preparation

Lecture 8 - Sample preparation

Lecture 9 - One-dimensional electrophoresis

Lecture 10 - Introduction to 2-DE

Lecture 11 - 2-DE

Lecture 12 - 2-DE

Lecture 13 - 2-DE Applications

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

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

Lecture 16 - 2D-DIGE

Lecture 17 - 2D-DIGE

Lecture 18 - 2D-DIGE

Lecture 19 - Systems biology and proteomics - I

Lecture 20 - Systems biology and proteomics - II

Lecture 21 - Fundamentals of mass spectrometry

Lecture 22 - Chromatography technologies

Lecture 23 - Liquid chromatography

Lecture 24 - Mass spectrometry

Lecture 25 - Mass spectrometry

Lecture 26 - MALDI sample preparation and analysis

Lecture 27 - Hybrid mass spectrometry configurations

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

Lecture 29 - In-gel and in-solution digestion

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

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

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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

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

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

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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)

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

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

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

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

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

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

Subject Co-ordinator - Prof. Sanjeeva Srivastava

Co-ordinating Institute - IIT - Bombay

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

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

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

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- 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  
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Lecture 28  
Lecture 29

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

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Lecture 59  
Lecture 60  
Lecture 61



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

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- Lecture 30 -  $\int \sin x \cos x dx$  :  $\frac{1}{2} \sin^2 x + C$
- Lecture 31 -  $\int \sin^2 x dx$  :  $\frac{x}{2} - \frac{\sin 2x}{4} + C$
- Lecture 32 -  $\int \sin x \cos^2 x dx$  :  $-\frac{\cos^3 x}{3} + C$
- Lecture 33 -  $\int \sin^3 x dx$  :  $-\cos x + \frac{\cos^3 x}{3} + C$
- Lecture 34 -  $\int \sin^4 x dx$  :  $\frac{3x}{8} - \frac{\sin 2x}{4} + \frac{\sin 4x}{32} + C$
- Lecture 35 -  $\int \sin^5 x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + C$
- Lecture 36 -  $\int \sin^6 x dx$  :  $\frac{5x}{6} - \frac{\sin 2x}{4} + \frac{\sin 4x}{32} - \frac{\sin 6x}{192} + C$
- Lecture 37 -  $\int \sin^7 x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} + C$
- Lecture 38 -  $\int \sin^8 x dx$  :  $\frac{7x}{8} - \frac{7 \sin 2x}{16} + \frac{7 \sin 4x}{256} - \frac{7 \sin 6x}{2048} + \frac{7 \sin 8x}{16384} + C$
- Lecture 39 -  $\int \sin^9 x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + C$
- Lecture 40 -  $\int \sin^{10} x dx$  :  $\frac{9x}{10} - \frac{9 \sin 2x}{16} + \frac{9 \sin 4x}{256} - \frac{9 \sin 6x}{13104} + \frac{9 \sin 8x}{65536} - \frac{9 \sin 10x}{1048576} + C$
- Lecture 41 -  $\int \sin^{11} x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + \frac{\cos^{11} x}{11} + C$
- Lecture 42 -  $\int \sin^{12} x dx$  :  $\frac{11x}{12} - \frac{11 \sin 2x}{16} + \frac{11 \sin 4x}{256} - \frac{11 \sin 6x}{13104} + \frac{11 \sin 8x}{65536} - \frac{11 \sin 10x}{1048576} + \frac{11 \sin 12x}{10485760} + C$
- Lecture 43 -  $\int \sin^{13} x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + \frac{\cos^{11} x}{11} - \frac{\cos^{13} x}{13} + C$
- Lecture 44 -  $\int \sin^{14} x dx$  :  $\frac{13x}{14} - \frac{13 \sin 2x}{16} + \frac{13 \sin 4x}{256} - \frac{13 \sin 6x}{13104} + \frac{13 \sin 8x}{65536} - \frac{13 \sin 10x}{1048576} + \frac{13 \sin 12x}{10485760} - \frac{13 \sin 14x}{104857600} + C$
- Lecture 45 -  $\int \sin^{15} x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + \frac{\cos^{11} x}{11} - \frac{\cos^{13} x}{13} + \frac{\cos^{15} x}{15} + C$
- Lecture 46 -  $\int \sin^{16} x dx$  :  $\frac{15x}{16} - \frac{15 \sin 2x}{16} + \frac{15 \sin 4x}{256} - \frac{15 \sin 6x}{13104} + \frac{15 \sin 8x}{65536} - \frac{15 \sin 10x}{1048576} + \frac{15 \sin 12x}{10485760} - \frac{15 \sin 14x}{104857600} + \frac{15 \sin 16x}{1048576000} + C$
- Lecture 47 -  $\int \sin^{17} x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + \frac{\cos^{11} x}{11} - \frac{\cos^{13} x}{13} + \frac{\cos^{15} x}{15} - \frac{\cos^{17} x}{17} + C$
- Lecture 48 -  $\int \sin^{18} x dx$  :  $\frac{17x}{18} - \frac{17 \sin 2x}{16} + \frac{17 \sin 4x}{256} - \frac{17 \sin 6x}{13104} + \frac{17 \sin 8x}{65536} - \frac{17 \sin 10x}{1048576} + \frac{17 \sin 12x}{10485760} - \frac{17 \sin 14x}{104857600} + \frac{17 \sin 16x}{1048576000} - \frac{17 \sin 18x}{10485760000} + C$
- Lecture 49 -  $\int \sin^{19} x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + \frac{\cos^{11} x}{11} - \frac{\cos^{13} x}{13} + \frac{\cos^{15} x}{15} - \frac{\cos^{17} x}{17} + \frac{\cos^{19} x}{19} + C$
- Lecture 50 -  $\int \sin^{20} x dx$  :  $\frac{19x}{20} - \frac{19 \sin 2x}{16} + \frac{19 \sin 4x}{256} - \frac{19 \sin 6x}{13104} + \frac{19 \sin 8x}{65536} - \frac{19 \sin 10x}{1048576} + \frac{19 \sin 12x}{10485760} - \frac{19 \sin 14x}{104857600} + \frac{19 \sin 16x}{1048576000} - \frac{19 \sin 18x}{10485760000} + \frac{19 \sin 20x}{104857600000} + C$
- Lecture 51 -  $\int \sin^{21} x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + \frac{\cos^{11} x}{11} - \frac{\cos^{13} x}{13} + \frac{\cos^{15} x}{15} - \frac{\cos^{17} x}{17} + \frac{\cos^{19} x}{19} - \frac{\cos^{21} x}{21} + C$
- Lecture 52 -  $\int \sin^{22} x dx$  :  $\frac{21x}{22} - \frac{21 \sin 2x}{16} + \frac{21 \sin 4x}{256} - \frac{21 \sin 6x}{13104} + \frac{21 \sin 8x}{65536} - \frac{21 \sin 10x}{1048576} + \frac{21 \sin 12x}{10485760} - \frac{21 \sin 14x}{104857600} + \frac{21 \sin 16x}{1048576000} - \frac{21 \sin 18x}{10485760000} + \frac{21 \sin 20x}{104857600000} - \frac{21 \sin 22x}{1048576000000} + C$
- Lecture 53 -  $\int \sin^{23} x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + \frac{\cos^{11} x}{11} - \frac{\cos^{13} x}{13} + \frac{\cos^{15} x}{15} - \frac{\cos^{17} x}{17} + \frac{\cos^{19} x}{19} - \frac{\cos^{21} x}{21} + \frac{\cos^{23} x}{23} + C$
- Lecture 54 -  $\int \sin^{24} x dx$  :  $\frac{23x}{24} - \frac{23 \sin 2x}{16} + \frac{23 \sin 4x}{256} - \frac{23 \sin 6x}{13104} + \frac{23 \sin 8x}{65536} - \frac{23 \sin 10x}{1048576} + \frac{23 \sin 12x}{10485760} - \frac{23 \sin 14x}{104857600} + \frac{23 \sin 16x}{1048576000} - \frac{23 \sin 18x}{10485760000} + \frac{23 \sin 20x}{104857600000} - \frac{23 \sin 22x}{1048576000000} + \frac{23 \sin 24x}{10485760000000} + C$
- Lecture 55 -  $\int \sin^{25} x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + \frac{\cos^{11} x}{11} - \frac{\cos^{13} x}{13} + \frac{\cos^{15} x}{15} - \frac{\cos^{17} x}{17} + \frac{\cos^{19} x}{19} - \frac{\cos^{21} x}{21} + \frac{\cos^{23} x}{23} - \frac{\cos^{25} x}{25} + C$
- Lecture 56 -  $\int \sin^{26} x dx$  :  $\frac{25x}{26} - \frac{25 \sin 2x}{16} + \frac{25 \sin 4x}{256} - \frac{25 \sin 6x}{13104} + \frac{25 \sin 8x}{65536} - \frac{25 \sin 10x}{1048576} + \frac{25 \sin 12x}{10485760} - \frac{25 \sin 14x}{104857600} + \frac{25 \sin 16x}{1048576000} - \frac{25 \sin 18x}{10485760000} + \frac{25 \sin 20x}{104857600000} - \frac{25 \sin 22x}{1048576000000} + \frac{25 \sin 24x}{10485760000000} - \frac{25 \sin 26x}{104857600000000} + C$
- Lecture 57 -  $\int \sin^{27} x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + \frac{\cos^{11} x}{11} - \frac{\cos^{13} x}{13} + \frac{\cos^{15} x}{15} - \frac{\cos^{17} x}{17} + \frac{\cos^{19} x}{19} - \frac{\cos^{21} x}{21} + \frac{\cos^{23} x}{23} - \frac{\cos^{25} x}{25} + \frac{\cos^{27} x}{27} + C$
- Lecture 58 -  $\int \sin^{28} x dx$  :  $\frac{27x}{28} - \frac{27 \sin 2x}{16} + \frac{27 \sin 4x}{256} - \frac{27 \sin 6x}{13104} + \frac{27 \sin 8x}{65536} - \frac{27 \sin 10x}{1048576} + \frac{27 \sin 12x}{10485760} - \frac{27 \sin 14x}{104857600} + \frac{27 \sin 16x}{1048576000} - \frac{27 \sin 18x}{10485760000} + \frac{27 \sin 20x}{104857600000} - \frac{27 \sin 22x}{1048576000000} + \frac{27 \sin 24x}{10485760000000} - \frac{27 \sin 26x}{104857600000000} + \frac{27 \sin 28x}{1048576000000000} + C$
- Lecture 59 -  $\int \sin^{29} x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + \frac{\cos^{11} x}{11} - \frac{\cos^{13} x}{13} + \frac{\cos^{15} x}{15} - \frac{\cos^{17} x}{17} + \frac{\cos^{19} x}{19} - \frac{\cos^{21} x}{21} + \frac{\cos^{23} x}{23} - \frac{\cos^{25} x}{25} + \frac{\cos^{27} x}{27} - \frac{\cos^{29} x}{29} + C$
- Lecture 60 -  $\int \sin^{30} x dx$  :  $\frac{29x}{30} - \frac{29 \sin 2x}{16} + \frac{29 \sin 4x}{256} - \frac{29 \sin 6x}{13104} + \frac{29 \sin 8x}{65536} - \frac{29 \sin 10x}{1048576} + \frac{29 \sin 12x}{10485760} - \frac{29 \sin 14x}{104857600} + \frac{29 \sin 16x}{1048576000} - \frac{29 \sin 18x}{10485760000} + \frac{29 \sin 20x}{104857600000} - \frac{29 \sin 22x}{1048576000000} + \frac{29 \sin 24x}{10485760000000} - \frac{29 \sin 26x}{104857600000000} + \frac{29 \sin 28x}{1048576000000000} - \frac{29 \sin 30x}{10485760000000000} + C$
- Lecture 61 -  $\int \sin^{31} x dx$  :  $-\cos x + \frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + \frac{\cos^7 x}{7} - \frac{\cos^9 x}{9} + \frac{\cos^{11} x}{11} - \frac{\cos^{13} x}{13} + \frac{\cos^{15} x}{15} - \frac{\cos^{17} x}{17} + \frac{\cos^{19} x}{19} - \frac{\cos^{21} x}{21} + \frac{\cos^{23} x}{23} - \frac{\cos^{25} x}{25} + \frac{\cos^{27} x}{27} - \frac{\cos^{29} x}{29} + \frac{\cos^{31} x}{31} + C$
- Lecture 62 -  $\int \sin^{32} x dx$  :  $\frac{31x}{32} - \frac{31 \sin 2x}{16} + \frac{31 \sin 4x}{256} - \frac{31 \sin 6x}{13104} + \frac{31 \sin 8x}{65536} - \frac{31 \sin 10x}{1048576} + \frac{31 \sin 12x}{10485760} - \frac{31 \sin 14x}{104857600} + \frac{31 \sin 16x}{1048576000} - \frac{31 \sin 18x}{10485760000} + \frac{31 \sin 20x}{104857600000} - \frac{31 \sin 22x}{1048576000000} + \frac{31 \sin 24x}{10485760000000} - \frac{31 \sin 26x}{104857600000000} + \frac{31 \sin 28x}{1048576000000000} - \frac{31 \sin 30x}{10485760000000000} + \frac{31 \sin 32x}{104857600000000000} + C$

## 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 Lecture Topic List - Created by LinuXpert Systems, Chennai

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

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

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

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

NPTEL Video Course - Biotechnology - NOC:Biointerface Engineering

Subject Co-ordinator - Prof. Lalit M. Pandey

Co-ordinating Institute - IIT - Guwahati

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

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

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

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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

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

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

Subject Co-ordinator - Prof. Biplab Bose

Co-ordinating Institute - IIT - Guwahati

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

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

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

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

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

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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 - 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

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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

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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

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

NPTEL Video Course - Biotechnology - NOC:Bioenergy

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction

Lecture 2 - Oil Economy of the World

Lecture 3 - Unit of Energy and Introduction of Bioenergy

Lecture 4 - How Biomass Formed on the Earth

Lecture 5 - Road Map of Bioenergy

Lecture 6 - Basic Biomass Technology (Resources and Production)

Lecture 7 - Basics of Mechanism of Light Reaction

Lecture 8 - Exploration of Photosynthesis Process

Lecture 9 - In Photosynthesis Oxygen Comes from Water Molecule

Lecture 10 - Hill Reaction

Lecture 11 - Electron Transport Process in Light Reaction

Lecture 12 - How Carbon dioxide converted in Carbohydrate

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

Lecture 14 - RUBISCO enzyme

Lecture 15 - Photo respiration and Calvin Cycle

Lecture 16 - Efficiency Calculation of Photosynthesis Process

Lecture 17 - C3 and C4 Plant Structure and Photosynthesis Process

Lecture 18 - Biomass production System and their Categorization

Lecture 19 - Important Parameters for Selecting Biomass Crops

Lecture 20 - Factors Determining the Conversion Process - I

Lecture 21 - Factors Determining the Conversion Process - II

Lecture 22 - Factors Determining the Conversion Process - III

Lecture 23 - Conversion Technology

Lecture 24 - Conversion Process- (Combustion Process)

Lecture 25 - Pyrolysis Process

Lecture 26 - Classification of Pyrolysis

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

Lecture 28 - Spark Ignition Engine

Lecture 29 - Compression Ignition Engine

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

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

NPTEL Video Course - Biotechnology - NOC:Animal Physiology

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

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

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

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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

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- 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

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

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

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

Subject Co-ordinator - Mr. S. Ganesh

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction to the topic

Lecture 2 - Where do research ideas come from?

Lecture 3 - Inductive vs Deductive Reasoning

Lecture 4 - Scientific Hypothesis

Lecture 5 - Scientific Hypothesis (Continued...)

Lecture 6 - Testing the Hypothesis

Lecture 7 - Introduction to Scientific Writing

Lecture 8 - Writing an Abstract

Lecture 9 - Title for a Research Paper

Lecture 10 - Title and Keywords

Lecture 11 - Mileposts for the Article Writing

Lecture 12 - Writing the Methods Section

Lecture 13 - Writing the Results Section

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

Lecture 15 - How to Prepare Figures

Lecture 16 - How to Prepare Schematics

Lecture 17 - How to write Introduction and Discussion Sections

Lecture 18 - Finalizing the Manuscript and Ethics in Research

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

Lecture 20 - Tutorial Session

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

NPTEL Video Course - Biotechnology - NOC:Bioelectrochemistry

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Basic Concepts - I

Lecture 2 - Basic Concepts - II

Lecture 3 - Key Terms

Lecture 4 - Galvanic Cells - I

Lecture 5 - Galvanic Cells - II

Lecture 6 - Salt Bridge

Lecture 7 - Standard Potentials - I

Lecture 8 - Standard Potentials - II

Lecture 9 - Standard Potentials - III

Lecture 10 - Nernst Equation

Lecture 11 - Relationship between Standard electrode potential ( $E^\circ$ ) and Equilibrium constant (K)

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

Lecture 13 - Concept of Concentration Cell - I

Lecture 14 - Concept of Concentration Cell - II

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

Lecture 16 - Types of electrodes

Lecture 17 - Critical care profile and metal electrode

Lecture 18 - pH measurement

Lecture 19 - Redox indicators amperometry

Lecture 20 - Redox proteins, Metalloproteins and Cyclic Voltammetry

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

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

Subject Co-ordinator - Prof. Mainak Das

Co-ordinating Institute - IIT - Kanpur

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

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

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

NPTEL Video Course - Biotechnology - NOC:WildLife Conservation

Subject Co-ordinator - Dr. Ankur Awadhiya

Co-ordinating Institute - IIT - Kanpur

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

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

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

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

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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 - Biogeography
- Lecture 20 - Why are things where they are?
- Lecture 21 - Some push and pull factors in greater detail
- Lecture 22 - Threats to species
- Lecture 23 - In-situ conservation
- Lecture 24 - Ex-situ conservation
- Lecture 25 - Introduction and impacts
- Lecture 26 - Human population growth and food requirements
- Lecture 27 - Sustainable development
- Lecture 28 - Oil spills
- Lecture 29 - Plastic and biodiversity

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

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

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

Subject Co-ordinator - Dr. Ankur Awadhiya

Co-ordinating Institute - IIT - Kanpur

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

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

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

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

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

NPTEL Video Course - Biotechnology - NOC:Conservation Economics

Subject Co-ordinator - Dr. Ankur Awadhiya

Co-ordinating Institute - IIT - Kanpur

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

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

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- 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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- 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 - 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

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- Lecture 30 - Brewing industry (Continued...)
- Lecture 31 - Wine industry
- Lecture 32 - Vinegar production
- Lecture 33 - Citric acid production
- Lecture 34 - Citric acid production (Continued...)
- Lecture 35 - Citric acid production (Continued...)
- Lecture 36 - Lactic acid production
- Lecture 37 - Lactic acid production (Continued...)
- Lecture 38 - Glutamic acid production
- Lecture 39 - Penicillin production
- Lecture 40 - Penicillin production (Continued...)
- Lecture 41 - Cephalosporin production
- Lecture 42 - Streptomycin production
- Lecture 43 - Baker's yeast fermentation
- Lecture 44 - Baker's yeast fermentation (Continued...)
- Lecture 45 - Fodder yeast production
- Lecture 46 - Spirulina production
- Lecture 47 - Alpha amylase production
- Lecture 48 - High fructose corn syrup production
- Lecture 49 - Metal leaching
- Lecture 50 - Cheese production
- Lecture 51 - Cheese production (Continued...)
- Lecture 52 - Biodiesel production
- Lecture 53 - Butanol production
- Lecture 54 - Biofertilizer
- Lecture 55 - Aerobic effluent treatment process
- Lecture 56 - Aerobic effluent treatment process (Continued...)
- Lecture 57 - Anaerobic effluent treatment process
- Lecture 58 - Anaerobic effluent treatment process
- Lecture 59 - 10 m<sup>3</sup> Pilot Plant operation for Biohydrogen production
- Lecture 60 - Summary and conclusion

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

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

Subject Co-ordinator - Prof. Debabrata Das

Co-ordinating Institute - IIT - Kharagpur

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

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

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

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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 - I
- Lecture 32 - Kinetics of substrate utilization, product formation and biomass production of microbial cells - II
- Lecture 33 - Kinetics of substrate utilization, product formation and biomass production of microbial cells - III
- Lecture 34 - Kinetics of substrate utilization, product formation and biomass production of microbial cells - IV
- Lecture 35 - Kinetics of substrate utilization, product formation and biomass production of microbial cells - V
- Lecture 36 - Kinetics of substrate utilization, product formation and biomass production of microbial cells - VI
- Lecture 37 - Kinetics of substrate utilization, product formation and biomass production of microbial cells - VII
- Lecture 38 - Kinetics of substrate utilization, product formation and biomass production of microbial cells - VIII
- Lecture 39 - Kinetics of substrate utilization, product formation and biomass production of microbial cells - IX
- Lecture 40 - Kinetics of substrate utilization, product formation and biomass production of microbial cells - X
- Lecture 41 - Kinetics of substrate utilization, product formation and biomass production of microbial cells - XI
- 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

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

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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 -  $^{13}\text{C}$  Metabolic Flux Analysis ( $^{13}\text{C}$  MFA)
- Lecture 25 -  $^{13}\text{C}$  Metabolic Flux Analysis ( $^{13}\text{C}$  MFA)
- Lecture 26 - Advancement in  $^{13}\text{C}$  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

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

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

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

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

Co-ordinating Institute - IIT - Kharagpur

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

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

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

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

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

NPTEL Video Course - Biotechnology - NOC:Environmental Biotechnology

Subject Co-ordinator - Prof. Pinaki Sar

Co-ordinating Institute - IIT - Kharagpur

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

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

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

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

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

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

Subject Co-ordinator - Prof. Swagata Dasgupta

Co-ordinating Institute - IIT - Kharagpur

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

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

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

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

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

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

Subject Co-ordinator - Dr. Arun K.Tangirala

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction - 1  
Lecture 2 - Introduction - 2  
Lecture 3 - Signals and Systems Overview  
Lecture 4 - Important Signals  
Lecture 5 - System  
Lecture 6 - LSI Systems  
Lecture 7 - Image Quality  
Lecture 8 - Local Contrast  
Lecture 9 - Blurring and Noise  
Lecture 10 - Physics of Radiography  
Lecture 11 - Types of Ionizing Radiations  
Lecture 12 - EM Radiation  
Lecture 13 - Attenuation Models  
Lecture 14 - Radiation Dosimetry  
Lecture 15 - PR\_Instrument  
Lecture 16 - PR\_Instru\_CA  
Lecture 17 - PR\_Image\_formation  
Lecture 18 - Imaging Equation\_updated  
Lecture 19 - Film screen\_Optical Density  
Lecture 20 - PR\_Image Quality  
Lecture 21 - CT\_Intsru  
Lecture 22 - CT\_Instru\_finish  
Lecture 23 - CT Back projection  
Lecture 24 - CT\_BP\_finish  
Lecture 25 - Fan beam\_IQ  
Lecture 26 - CT\_IQ\_Artifact  
Lecture 27 - Nuclear Med\_Phys  
Lecture 28 - Nuclear\_Med\_Radiotracers  
Lecture 29 - Planar\_Scintigraphy\_Instru

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

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

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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 Acitivity
- Lecture 11 - Point and compartmental models of neurons
- Lecture 12 - Hodgkin Huxley Equations - I
- Lecture 13 - Hodgkin Huxley Equations - II
- Lecture 14 - Reducing the HHE and Moris-Lecar Equations (MLE)
- Lecture 15 - Properties of MLE
- Lecture 16 - Phase Plane Analysis - I
- Lecture 17 - Phase Plane Analysis - II
- Lecture 18 - Phase Plane Analysis - III
- Lecture 19 - Analysing HHE with Phase Plane Analysis - I
- Lecture 20 - Analysing HHE with Phase Plane Analysis - II
- Lecture 21 - Random variables and random process
- Lecture 22 - Spike train statistics and response measure
- Lecture 23 - Receptive fields and models of receptive fields
- Lecture 24 - Stimulus to Response mapping (Coding) - I
- Lecture 25 - Stimulus to Response mapping (Coding) - II
- Lecture 26 - Stimulus to Response Mapping (Coding) - III
- Lecture 27 - Response to Stimulus Mapping (Decoding)
- Lecture 28 - Basics of Information Theory - I
- Lecture 29 - Basics of Information Theory - II

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

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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 - 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

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

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

NPTEL Video Course - Biotechnology - Thermodynamics

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

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction and Review

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

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

Lecture 4 - Maxwell's relations

Lecture 5 - Inter-Relationships between Thermodynamic Variables

Lecture 6 - Some Useful Mathematical Manipulations

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

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

Lecture 9 - Open Systems

Lecture 10 - Equations of State - Virial Equations

Lecture 11 - Equations of State - Cubic Equations

Lecture 12 - Volume Estimation

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

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

Lecture 15 - Residual Properties (Continued...)

Lecture 16 - Generalized Correlations and Residual Properties

Lecture 17 - Fugacity Coefficient Estimation

Lecture 18 - Review of Module 3

Lecture 19 - Learning Aspects Chemical Potential Formulations

Lecture 20 - Lewis and Randall rule partial Molar Properties

Lecture 21 - Partial Molar Property Estimation from Mixing Experiments

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

Lecture 23 - Activity Coefficient from Excess Property

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

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

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

Lecture 27 - Review of Module 4

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

Lecture 29 - Clausius - Clayperon Equation

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

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

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

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

Subject Co-ordinator - Prof. Mukesh Doble

Co-ordinating Institute - IIT - Madras

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

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

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

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

Subject Co-ordinator - Prof. Mukesh Doble

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction

Lecture 2 - Experimental Design Strategy

Lecture 3 - Data types

Lecture 4 - Poisson Distribution

Lecture 5 - Normal Distribution

Lecture 6 - Standardized Normal Distribution / t-distribution

Lecture 7 - t-distribution/confidence interval

Lecture 8 - Statistical tests

Lecture 9 - t-Test

Lecture 10 - t-Tests

Lecture 11 - t-test

Lecture 12 - F-tests

Lecture 13 - F-tests

Lecture 14 - ANOVA

Lecture 15 - ANOVA

Lecture 16 - Anova

Lecture 17 - Anova

Lecture 18 - Anova

Lecture 19 - Anova

Lecture 20 - Anova

Lecture 21 - Normality test / Odds ratio

Lecture 22 - Chi square distribution

Lecture 23 - Chi square distribution / test

Lecture 24 - Chi square test

Lecture 25 - Chi square test and Weibull Distribution

Lecture 26 - Weibull Distribution

Lecture 27 - Weibull distribution.

Lecture 28 - Non-parametric test

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

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

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

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

NPTEL Video Course - Biotechnology - NOC:Bioreactors

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

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction  
Lecture 2 - Sterilization  
Lecture 3 - Solution to PP 1.1  
Lecture 4 - Some important concepts  
Lecture 5 - Enzyme bioreactors, enzyme kinetics  
Lecture 6 - Solution to PP 2.1  
Lecture 7 - Inhibited enzyme kinetics  
Lecture 8 - Solution to PP 2.2  
Lecture 9 - Measurement principles and methods  
Lecture 10 - Batch growth kinetics  
Lecture 11 - Solution to PP 3.1  
Lecture 12 - Bioreactor analysis  
Lecture 13 - Solution to PP 3.2  
Lecture 14 - Bioreactor environment parameters  
Lecture 15 - Bioreactor env. par. (DO)  
Lecture 16 - Solution to PP 4.1  
Lecture 17 - Shear stress, scale-up, scale-down  
Lecture 18 - Cell view  
Lecture 19 - Solution to PP 5.1  
Lecture 20 - Culture status, metabolic flux analysis  
Lecture 21 - Course summary

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

NPTEL Video Course - Biotechnology - NOC:Medical Biomaterials

Subject Co-ordinator - Prof. Mukesh Doble

Co-ordinating Institute - IIT - Madras

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

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

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

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

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

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

Subject Co-ordinator - Prof. M. Michael Gromiha

Co-ordinating Institute - IIT - Madras

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

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

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

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

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Lecture 69 - Demo

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

NPTEL Video Course - Biotechnology - NOC:Demystifying the Brain

Subject Co-ordinator - Dr. V Srinivasa Chakravarthy

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - The Whole and Its Parts

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

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

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

Lecture 5 - Neurons and Neural Signaling

Lecture 6 - Neural Signalling

Lecture 7 - Networks that Learn - Segment 1

Lecture 8 - Multilayer Perceptrons Applications in Psychology and Neuroscience

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

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

Lecture 11 - Maps in the Brain - Segment 1

Lecture 12 - Maps in the Brain - Segment 2

Lecture 13 - Emotions in the Brain - Segment 1

Lecture 14 - Emotions in the Brain - Segment 2

Lecture 15 - Memories and Holograms - Segment 1

Lecture 16 - Memories and Holograms - Segment 2

Lecture 17 - Consciousness - Segment 1

Lecture 18 - Consciousness - Segment 2

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

NPTEL Video Course - Biotechnology - NOC:Computational Systems Biology

Subject Co-ordinator - Prof. Karthik Raman

Co-ordinating Institute - IIT - Madras

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

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

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

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

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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 -  $^{13}\text{C}$ -Metabolic Flux Analysis using Mass Spectrometry
- Lecture 83 -  $^{13}\text{C}$ -Metabolic Flux Analysis using Mass Spectrometry
- Lecture 84 -  $^{13}\text{C}$ -Metabolic Flux Analysis using Mass Spectrometry
- Lecture 85 - Lab
- Lecture 86 - Modelling Gene Regulatory Networks
- Lecture 87 - Modelling Gene Regulatory Networks
- Lecture 88 - Modelling Gene Regulatory Networks
- Lecture 89 - Lab
- Lecture 90 - Lab
- Lecture 91 - Computational Modelling of Host-Pathogen Interactions
- Lecture 92 - Computational Modelling of Host-Pathogen Interactions
- Lecture 93 - Robustness in Biological Systems
- Lecture 94 - Robustness in Biological Systems
- Lecture 95 - Robustness in Biological Systems
- Lecture 96 - Robustness in Biological Systems
- Lecture 97 - Robustness and Evolvability
- Lecture 98 - Robustness and Evolvability
- Lecture 99 - Introduction to Synthetic Biology
- Lecture 100 - Advanced Topics
- Lecture 101 - Advanced Topics
- Lecture 102 - Advanced Topics
- Lecture 103 - Course Recap

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

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

Subject Co-ordinator - Prof.Vignesh Muthuvijayan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Fundamentals of Engineering Calculations

Lecture 2 - Process Parameters and Variables

Lecture 3 - Fundamentals of Material Balances

Lecture 4 - Material Balance Calculations for Single Units Without Reactions - Part 1

Lecture 5 - Material Balance Calculations for Single Units Without Reactions - Part 2

Lecture 6 - Material Balance Calculations for Single Units Without Reactions - Part 3

Lecture 7 - Material Balance Calculations for Single Units Without Reactions - Part 4

Lecture 8 - Material Balance Calculations for Multiple Units Without Reactions - Part 1

Lecture 9 - Material Balance Calculations for Multiple Units Without Reactions - Part 2

Lecture 10 - Fundamentals of Reactive Processes

Lecture 11 - Material Balance Calculations For Single Units With A Single Reaction

Lecture 12 - Material Balance Calculations for Single Units with A Single Reaction (Continued...)

Lecture 13 - Material Balance Calculations for Single Units with Multiple Reactions - Part 1

Lecture 14 - Material Balance Calculations for Single Units with Multiple Reactions - Part 2

Lecture 15 - Material Balance Calculations for Single Units with Multiple Reactions - Part 3

Lecture 16 - Material Balance Calculations for Multiple Units with Reactions - Part 1

Lecture 17 - Material Balance Calculations for Multiple Units with Reactions - Part 2

Lecture 18 - Material Balances on Reactive Processes - Tutorials

Lecture 19 - Combustion Reactions

Lecture 20 - Material Balances for Combustion Reactions

Lecture 21 - Biochemical Reactions

Lecture 22 - Biochemical Reactions

Lecture 23 - Recycle Without Reactions

Lecture 24 - Recycle with Reactions

Lecture 25 - Recycle

Lecture 26 - Bypass

Lecture 27 - Purge

Lecture 28 - Material Balance

Lecture 29 - Material Balance

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

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

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

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

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



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

NPTEL Video Course - Biotechnology - NOC:Plant Cell Bioprocessing

Subject Co-ordinator - Prof. Smita Srivastava

Co-ordinating Institute - IIT - Madras

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

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

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

NPTEL Video Course - Biotechnology - NOC:Tissue Engineering

Subject Co-ordinator - Prof.Vignesh Muthuvijayan

Co-ordinating Institute - IIT - Madras

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

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

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

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

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

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

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

Co-ordinating Institute - IIT - Madras

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

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

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

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

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

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

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

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

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

Co-ordinating Institute - IIT - Madras

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

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

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

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

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

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

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

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

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

Subject Co-ordinator - Prof. Subramaniam K

Co-ordinating Institute - IIT - Madras

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

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

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

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

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

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

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

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction - Part 1

Lecture 2 - Introduction - Part 2

Lecture 3 - Introduction - Part 3

Lecture 4 - Solids vs Fluids

Lecture 5 - Viscosity

Lecture 6 - Measuring Viscosity

Lecture 7 - Tutorial - Part 1

Lecture 8 - Tutorial - Part 2

Lecture 9 - Tutorial - Part 3

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

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

Lecture 12 - Reynolds Number

Lecture 13 - Tutorial - Part 1

Lecture 14 - Tutorial - Part 2

Lecture 15 - Tutorial - Part 3

Lecture 16 - Hagen-Poiseuille Equation

Lecture 17 - Tutorial - Part 4

Lecture 18 - Sedimentation and Centrifugation - Part 1

Lecture 19 - Sedimentation and Centrifugation - Part 2

Lecture 20 - Blood Centrifugation

Lecture 21 - Review: Paperfuge for Hematology

Lecture 22 - Biology by Numbers

Lecture 23 - Biology by Numbers: Bomb Yield Solved

Lecture 24 - Order of Magnitude Estimates and Approximations

Lecture 25 - Physical Basis of Life

Lecture 26 - Approximating Cellular and Molecular Size Scales

Lecture 27 - Quantifying DNA and Chromatin

Lecture 28 - Protein Abundance and Spacing

Lecture 29 - Model Gene

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



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

NPTEL Video Course - Biotechnology - NOC:Medical Image Analysis

Subject Co-ordinator - Prof. Ganapathy Krishnamurthi

Co-ordinating Institute - IIT - Madras

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

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

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- 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

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

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

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

Subject Co-ordinator - Prof. Girish Ratnaparkhi

Co-ordinating Institute - IIT - Madras

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

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

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

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

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

NPTEL Video Course - Biotechnology - NOC:RNA Biology

Subject Co-ordinator - Prof. Rajesh Ramachandran

Co-ordinating Institute - IIT - Madras

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

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

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



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

NPTEL Video Course - Biotechnology - NOC:Biomechanics

Subject Co-ordinator - Prof. Varadhan

Co-ordinating Institute - IIT - Madras

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

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

Lecture 2 - Statics FBD and EOE

Lecture 3 - Example problems on FBD and EOE

Lecture 4 - Joints in human body

Lecture 5 - Machines and mechanical advantage

Lecture 6 - Levers and types of levers

Lecture 7 - Insertion point and torque

Lecture 8 - Practice problem - 1

Lecture 9 - Practice problem - 2

Lecture 10 - Key terminologies

Lecture 11 - Anatomical planes and axis

Lecture 12 - Sagittal plane movements

Lecture 13 - Coronal plane movements

Lecture 14 - Transverse plane movements

Lecture 15 - Muscles - Muscle fascicles

Lecture 16 - Muscle fibers- Pennation angle

Lecture 17 - More on pennation angle

Lecture 18 - Excitation contraction coupling

Lecture 19 - Sliding filament theory

Lecture 20 - Force length relationship

Lecture 21 - Shoulder joints and muscles

Lecture 22 - Shoulder problem - 1

Lecture 23 - Shoulder problem - 2

Lecture 24 - Elbow theory

Lecture 25 - Elbow problem - 1

Lecture 26 - Elbow problem - 2

Lecture 27 - Elbow problem - 3

Lecture 28 - Wrist theory

Lecture 29 - Finger theory

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

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

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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 - Analytical Technologies in Biotechnology

Subject Co-ordinator - Dr. Ashwani K. Sharma

Co-ordinating Institute - IIT - Roorkee

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

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

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

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

NPTEL Video Course - Biotechnology - NOC:Biomedical Nanotechnology

Subject Co-ordinator - Prof. P.Gopinath

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction to Nano

Lecture 2 - Nano-Biomimicry

Lecture 3 - Synthesis of nanomaterials by Physical and Chemical Methods

Lecture 4 - Synthesis of nanomaterials by Biological Methods

Lecture 5 - Characterisation of Nanomaterials

Lecture 6 - DNA Nanotechnology

Lecture 7 - Protein and Glyco Nanotechnology

Lecture 8 - Lipid Nanotechnology

Lecture 9 - Bio-Nanomachines

Lecture 10 - Carbon nanotubes and Its Bio-Applications

Lecture 11 - Nanomaterials for Cancer Diagnosis

Lecture 12 - Nanomaterials for Cancer therapy

Lecture 13 - Nanotechnology in Tissue Engineering

Lecture 14 - Nano artificial cells

Lecture 15 - Nanotechnology in Organ Printing

Lecture 16 - Nanotechnology in Point-of-Care Diagnostics

Lecture 17 - Nano-Pharmacology and Drug Targeting

Lecture 18 - Cellular uptake mechanisms of nanomaterials

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

Lecture 20 - Nanotoxicology

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

NPTEL Video Course - Biotechnology - NOC:Plant Developmental Biology

Subject Co-ordinator - Prof. Shri Ram Yadav

Co-ordinating Institute - IIT - Roorkee

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

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

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

NPTEL Video Course - Biotechnology - NOC:Structural Biology

Subject Co-ordinator - Prof. Saugata Hazra

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction: Why to Study Structural Biology

Lecture 2 - Introduction to Biological Macromolecules

Lecture 3 - Introduction: Decoding Biological Macromolecules

Lecture 4 - Introduction: Genome Sequencing

Lecture 5 - Introduction: Post Genomic Era

Lecture 6 - Amino acids and their properties

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

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

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

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

Lecture 11 - Introduction to Structural Biology Techniques - Part I

Lecture 12 - Introduction to Structural Biology Techniques - Part II

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

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

Lecture 15 - X-ray Crystallography: Crystal Mounting

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

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

Lecture 18 - X-ray Crystallography: Crystal Symmetry

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

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

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

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

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

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

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

Lecture 26 - Introduction to Spectroscopy and NMR

Lecture 27 - Basic Principles of NMR and Instrumentation

Lecture 28 - NMR Sample Preparation and Chemical Shift related concepts

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

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

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

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

Subject Co-ordinator - Prof. Balaji Jayaprakash

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction to Learning and Memory - I

Lecture 2 - Introduction to Learning and Memory - II

Lecture 3 - Associative Learning I

Lecture 4 - Associative learning II

Lecture 5 - Introduction to the Rescorla Wagner Model

Lecture 6 - Application of Rescorla Wagner Model - I

Lecture 7 - Application of Rescorla Wagner Model - II

Lecture 8 - Application of Rescorla Wagner Model - III

Lecture 9 - Application of Rescorla Wagner Model - IV

Lecture 10 - Limitations of Rescorla Wagner Model

Lecture 11 - Introduction of Reinforcement Learning - I

Lecture 12 - Introduction of Reinforcement Learning - II

Lecture 13 - Introduction of Reinforcement Learning - III

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

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

Lecture 16 - Memory in Molecular Terms - I

Lecture 17 - Memory in Molecular Terms - II

Lecture 18 - Memory in Molecular Terms - III

Lecture 19 - Memory in Molecular Terms - IV

Lecture 20 - Memory in Molecular Terms - V

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

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

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

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

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

Subject Co-ordinator - Prof. Shankar Selvaraja

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction

Lecture 2 - Substrate

Lecture 3 - Substrate (Continued...)

Lecture 4 - Introduction to cleanroom

Lecture 5 - Contamination and surface cleaning

Lecture 6 - Advanced cleaning techniques

Lecture 7 - Defects

Lecture 8 - Diffusion

Lecture 9 - Diffusion - Advanced Concepts

Lecture 10 - Ion Implantation

Lecture 11 - Ion Implantation (Continued...)

Lecture 12 - Native Films

Lecture 13 - Native Films

Lecture 14 - Native Films

Lecture 15 - Methods and Some Definitions

Lecture 16 - Chemical Vapor Deposition

Lecture 17 - Chemical Vapor Deposition

Lecture 18 - Chemical Vapor Deposition

Lecture 19 - Chemical Vapor Deposition

Lecture 20 - Chemical Vapor Deposition

Lecture 21 - Atomic Layer Deposition

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

Lecture 23 - Physical Vapor Deposition

Lecture 24 - Physical Vapor Deposition

Lecture 25 - Physical Vapor Deposition

Lecture 26 - Metallization

Lecture 27 - Metallization

Lecture 28 - Pattern Transfer Basics

Lecture 29 - Optical lithography basics

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

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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

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

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

Subject Co-ordinator - Prof. Balaji Jayaprakash

Co-ordinating Institute - IISc - Bangalore

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

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

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

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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



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

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

Subject Co-ordinator - Prof. Shikha Laloraya

Co-ordinating Institute - IISc - Bangalore

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

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

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