

**NPTEL : Applied Mechanics (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. Sanjeev Sanghi, Prof. R.K. Mittal**

Lecture 1 - Preliminary Concepts

Lecture 2 - Vector Analysis

Lecture 3 - Analysis of Forces

Lecture 4 - Analysis of Equilibrium

Lecture 5 - Structural Mechanics - Part-1

Lecture 6 - Structural Mechanics - Part-2

Lecture 7 - Friction and its Applications - Part-1

Lecture 8 - Friction and its Applications - Part-2

Lecture 9 - Friction and its Applications - Part-3

Lecture 10 - Properties of Surfaces - Part-1

Lecture 11 - Properties of Surfaces - Part-2

Lecture 12 - Properties of Surfaces - Part-3

Lecture 13 - Moments and Products of Inertia

Lecture 14 - Methods of Virtual Work and Potential Energy - Part-1

Lecture 15 - Methods of Virtual Work and Potential Energy - Part-2

Lecture 16 - Stability of Equilibrium

**NPTEL : Management Science I (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. Anuradha Sharma**

Lecture 1 - Introduction

Lecture 2 - Motivation

Lecture 3 - Management

Lecture 4 - Work Ethics

Lecture 5 - Comparison Between Theories

Lecture 6 - Job Enrichment

Lecture 7 - Team Building and Participation

Lecture 8 - Other Leadership Styles

Lecture 9 - Empowerment

Lecture 10 - Barriers to Communication

Lecture 11 - Issues in Leadership

Lecture 12 - Participation Management and Team Working Part - 1

Lecture 13 - Participation Management and Team Working Part - 2

Lecture 14 - Participation Management and Team Working Part - 3

Lecture 15 - Participative Management and Team Working Part - 5

Lecture 16 - Organizations

Lecture 17 - Some Management Concepts - Part - 1

Lecture 18 - Some Management Concepts - Part - 2

Lecture 19 - Some Management Concepts - Part - 3

Lecture 20 - Diversity at Work Place and Management Issues

Lecture 21 - Industrial Relations and Conflict Management - Part - 1

Lecture 22 - Industrial Relations and Conflict Management - Part - 2

Lecture 23 - Selection and Training of Employees

Lecture 24 - Performance Management - Part - 1

Lecture 25 - Performance Management - Part - 2

Lecture 26 - Performance Management - Part - 3

Lecture 27 - Management Research: Some Methodological Issues-Part-2

Lecture 28 - Corporate Social Responsibilities

Lecture 29 - Women, Work and Organizations: Management Perspective - Part - 1

Lecture 30 - Women, Work and Organizations: Management Perspective - Part - 2

Lecture 31 - Selection, Recruitment and Training

Lecture 32 - Management of Change in Organization

Lecture 33 - Organizational Development

Lecture 34 - Values, Ethics and Corporate Social Responsibilities - Part - 1

Lecture 35 - Values, Ethics and Corporate Social Responsibilities - Part - 2

Lecture 36 - Management: Now and Beyond - Part - 1

Lecture 37 - Management: Now and Beyond - Part - 2

Lecture 38 - Management: Now and Beyond - Part - 3

Lecture 39 - Conclusions

**NPTEL : Materials Science (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. S.K. Gupta**

- Lecture 1 - Introduction
- Lecture 2 - Internal Energy Enthalpy
- Lecture 3 - Crystal Geometry
- Lecture 4 - Crystal Geometry
- Lecture 5 - Crystal Geometry
- Lecture 6 - Crystal Structure
- Lecture 7 - Close Packing of Spheres of Equal Size
- Lecture 8 - Structure of Solid Materials
- Lecture 9 - Non Crystalline Solids
- Lecture 10 - Polymers (Continued)
- Lecture 11 - Crystal Imperfections
- Lecture 12 - Crystal Imperfections
- Lecture 13 - Crystal Imperfections
- Lecture 14 - Crystal Imperfections
- Lecture 15 - Crystal Imperfections
- Lecture 16 - Phase Diagrams
- Lecture 17 - Phase Diagrams
- Lecture 18 - Phase Diagrams
- Lecture 19 - Diffusion in Solids
- Lecture 20 - Diffusion in Solids
- Lecture 21 - Phase Transformations
- Lecture 22 - Phase Transformations
- Lecture 23 - Phase Transformations
- Lecture 24 - Transformations in Steels: Eutectoid Steel
- Lecture 25 - Phase Transformations; Precipitation Hardening
- Lecture 26 - Mechanical Behaviour of Materials
- Lecture 27 - Plastic Deformation
- Lecture 28 - Plastic Deformation
- Lecture 29 - Plastic Deformation
- Lecture 30 - Strengthening Mechanisms Creep
- Lecture 31 - Fracture

[Lecture 32 - Conductors and Resistors](#)

[Lecture 33 - Conductors and Resistors](#)

[Lecture 34 - Superconductors](#)

[Lecture 35 - Superconductors](#)

[Lecture 36 - Semiconductors](#)

**NPTEL : Numerical Methods and Computation (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. S.R.K. Iyengar**

- Lecture 1 - Errors in Computation and Numerical Instability
- Lecture 2 - Solution of Nonlinear Algebraic Equations - Part 1
- Lecture 3 - Solution of Nonlinear Algebraic Equations - Part 2
- Lecture 4 - Solution of Nonlinear Algebraic Equations - Part 3
- Lecture 5 - Solution of Nonlinear Algebraic Equations - Part 4
- Lecture 6 - Solution of Nonlinear Algebraic Equations - Part 5
- Lecture 7 - Solution of Nonlinear Algebraic Equations - Part 6
- Lecture 8 - Solution of Nonlinear Algebraic Equations - Part 7
- Lecture 9 - Solution of Nonlinear Algebraic Equations - Part 8
- Lecture 10 - Solution of Nonlinear Algebraic Equations - Part 9
- Lecture 11 - Solution of a System of Linear Algebraic Equations - Part 1
- Lecture 12 - Solution of a System of Linear Algebraic Equations - Part 2
- Lecture 13 - Solution of a System of Linear Algebraic Equations - Part 3
- Lecture 14 - Solution of a System of Linear Algebraic Equations - Part 4
- Lecture 15 - Solution of a System of Linear Algebraic Equations - Part 5
- Lecture 16 - Solution of a System of Linear Algebraic Equations - Part 6
- Lecture 17 - Solution of a System of Linear Algebraic Equations - Part 7
- Lecture 18 - Solution of a System of Linear Algebraic Equations - Part 8
- Lecture 19 - Solution of a System of Linear Algebraic Equations - Part 9
- Lecture 20 - Solution of a System of Linear Algebraic Equations - Part 10
- Lecture 21 - Solution of a System of Linear Algebraic Equations - Part 11
- Lecture 22 - Solution of a System of Linear Algebraic Equations - Part 12
- Lecture 23 - Solution of a System of Linear Algebraic Equations - Part 13
- Lecture 24 - Solution of a System of Linear Algebraic Equations - Part 14
- Lecture 25 - Interpolation and Approximation - Part 1
- Lecture 26 - Interpolation and Approximation - Part 2
- Lecture 27 - Interpolation and Approximation - Part 3
- Lecture 28 - Interpolation and Approximation - Part 4
- Lecture 29 - Interpolation and Approximation - Part 5
- Lecture 30 - Interpolation and Approximation - Part 6
- Lecture 31 - Interpolation and Approximation - Part 7

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[Lecture 32 - Interpolation and Approximation - Part 8](#)

[Lecture 33 - Interpolation and Approximation - Part 9](#)

[Lecture 34 - Numerical Differentiation and Integration - Part 1](#)

[Lecture 35 - Numerical Differentiation and Integration - Part 2](#)

[Lecture 36 - Numerical Differentiation and Integration - Part 3](#)

[Lecture 37 - Numerical Differentiation and Integration - Part 4](#)

[Lecture 38 - Numerical Differentiation and Integration - Part 5](#)

[Lecture 39 - Numerical Differentiation and Integration - Part 6](#)

[Lecture 40 - Numerical Differentiation and Integration - Part 7](#)

[Lecture 41 - Numerical Differentiation and Integration - Part 8](#)

**NPTEL : Engineering Mechanics (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. Manoj K Harbola**

Lecture 1 - Engineering Mechanics

Lecture 2 - Equilibrium - I

Lecture 3 - Equilibrium - II

Lecture 4 - Equilibrium - III

Lecture 5 - Plan Trusses - I

Lecture 6 - Plan Trusses - II

Lecture 7 - Friction

Lecture 8 - Properties of Surfaces - I

Lecture 9 - Properties of Surfaces - II

Lecture 10 - Properties of Surfaces - III

Lecture 11 - Method of Virtual Work

Lecture 12 - Motion of Particles Planar Polar Coordinates

Lecture 13 - Motion With Constraints

Lecture 14 - Motion of Particle With Friction

Lecture 15 - Motion of Particles With Drag

Lecture 16 - Momentum

Lecture 17 - Work and Energy - I

Lecture 18 - Work and Energy - II

Lecture 19 - Work and Energy - III

Lecture 20 - Work and Energy - IV

Lecture 21 - Rotational Motion - I

Lecture 22 - Rotational Motion - II

Lecture 23 - Rotational Motion - III

Lecture 24 - Rotational Motion - IV

Lecture 25 - Rotational Motion - V

Lecture 26 - Rotational Motion - VI

Lecture 27 - Simple Harmonic Motion - I

Lecture 28 - Simple Harmonic Motion - II

Lecture 29 - Simple Harmonic Motion - III

Lecture 30 - Motion in Uniformly Accelerating Frames

Lecture 31 - Motion In Rotating Frame





**NPTEL : Engineering Physics II (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. V. Ravishankar, Prof. S. Raychaudhuri**

Module - 1 lecture - 1

Module - 1 lecture - 2

Module - 1 lecture - 3

Module - 1 lecture - 4

Module - 2 lecture - 1

Module - 2 lecture - 2

Module - 2 lecture - 3

Module - 2 lecture - 4

Module - 2 lecture - 5

Module - 3 lecture - 1

Module - 3 lecture - 2

Module - 3 lecture - 3

Module - 3 lecture - 4

Module - 3 lecture - 5 (Lecture Missing)

Module - 3 lecture - 6

Module - 3 lecture - 7

Module - 3 lecture - 8

Module - 4 lecture - 1

Module - 4 lecture - 2

Module - 4 lecture - 3

Module - 4 lecture - 4

Module - 4 lecture - 5

Module - 4 lecture - 6

Module - 4 lecture - 7

Module - 4 lecture - 8

Module - 4 lecture - 9

Module - 4 lecture - 10

Module - 4 lecture - 11

Module - 4 lecture - 12

**NPTEL : Mathematics I (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. Swagato K. Ray, Prof. Shobha Madan, Dr. P. Shunmugaraj**

Lecture 1 - Real Number

Lecture 2 - Sequences I

Lecture 3 - Sequences II

Lecture 4 - Sequences III

Lecture 5 - Continuous Function

Lecture 6 - Properties of Continuous Function

Lecture 7 - Uniform Continuity

Lecture 8 - Differentiable Functions

Lecture 9 - Mean Value Theorem

Lecture 10 - Maxima - Minima

Lecture 11 - Taylor's Theorem

Lecture 12 - Curve Sketching

Lecture 13 - Infinite Series I

Lecture 14 - Infinite Series II

Lecture 15 - Tests of Convergence

Lecture 16 - Power Series

Lecture 17 - Riemann Integral

Lecture 18 - Riemann Integrable Functions

Lecture 19 - Applications of Riemann Integral

Lecture 20 - Length of a curve

Lecture 21 - Line Integrals

Lecture 22 - Functions of Several Variables

Lecture 23 - Differentiation

Lecture 24 - Derivatives

Lecture 25 - Mean Value Theorem

Lecture 26 - Maxima Minima

Lecture 27 - Method of Lagrange Multipliers

Lecture 28 - Multiple Integrals

Lecture 29 - Surface Integrals

Lecture 30 - Green's Theorem

Lecture 31 - Stokes Theorem

Lecture 32 - Gauss Divergence Theorem

**NPTEL : Human Resource Management-I (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. Kalyan Chakravarti**

Lecture 1 - Nature and Scope of HRM

Lecture 2 - Analysing and Designing Job - I

Lecture 3 - Analysing and Designing Job - II

Lecture 4 - Human Resource Planning - I

Lecture 5 - Human Resource Planning - II

Lecture 6 - Recruitment and Selection

Lecture 7 - Performance Evaluation and Appraisal - I

Lecture 8 - Performance Evaluation and Appraisal (Continued...)

Lecture 9 - Training and Development

Lecture 10 - Employee Welfare

Lecture 11 - Safety, Health, Environment

Lecture 12 - Industrial Relations

Lecture 13 - Total Quality Management

Lecture 14 - Organization Culture

Lecture 15 - Change Management - Part - I

Lecture 16 - Change Management - Part - II

Lecture 17 - Wage and Salary Administration

Lecture 18 - Career Planning - Part - I

Lecture 19 - Career Planning - Part - II

Lecture 20 - Contemporary Issues in HRM - I

Lecture 21 - Contemporary Issues in HRM - II

Lecture 22 - Contemporary Issues in HRM - III

**NPTEL : Leadership (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. Kalyan Chakravarti**

Lecture 1 - Introduction to Leadership: Functions

Lecture 2 - Leadership Roles: Leaders Vs Managers: Theories

Lecture 3 - Leadership Styles: Effective Vs Successful Managers

Lecture 4 - Leadership Behaviour: Emergence: Leadership and Trust

Lecture 5 - Leadership Styles: Adaptation-Studies/Case: From Sindhi to Siddhi (Part-I)

Lecture 6 - Case: From Sindhi to Siddhi (Part-II) Transformation Leadership

Lecture 7 - Leadership Skills: Leadership and Management

Lecture 8 - Competencies and Skills of Leaders: Issues in Organizational Leadership

Lecture 9 - Case: The DVC Story-A First Person Account - Leadership in Action (Part-I)

Lecture 10 - Case: The DVC Story-A First Person Account- Leadership in Action (Part-II)

Lecture 11 - Case: Rai Bahadur Mohan Singh Oberoi (Part-I) Issues in Institution Building

Lecture 12 - Case: Rai Bahadur Mohan Singh Oberoi (Part-II)

Lecture 13 - Case: Self Regulation-The Key to Institution Building - Framework of Institution Building

**NPTEL : Management Information System (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. Biswajit Mahanty**

Lecture 1 - Introduction - I

Lecture 2 - Introduction - II

Lecture 3 - Introduction - III

Lecture 4 - Concept of Information - I

Lecture 5 - Concept of Information - II

Lecture 6 - Decision Making Process

Lecture 7 - Impact of IS on Management - I

Lecture 8 - Impact of IS on Management - II

Lecture 9 - Hardware Software Overview - I

Lecture 10 - Hardware Software Overview - II

Lecture 11 - Knowledge Management

Lecture 12 - Learning Organization

Lecture 13 - Decision Analysis - I

Lecture 14 - Decision Analysis - II

Lecture 15 - Decision Analysis - III

Lecture 16 - Data Flow Diagrams - I

Lecture 17 - Data Flow Diagrams - II

Lecture 18 - Data Flow Diagrams - III

Lecture 19 - Data Flow Diagrams - IV

Lecture 20 - System Design - I

Lecture 21 - System Design - II

Lecture 22 - DBMS - I

Lecture 23 - DBMS - II

Lecture 24 - DBMS - III

Lecture 25 - DBMS - IV

Lecture 26 - DBMS - V

Lecture 27 - OOAD - I

Lecture 28 - OOAD - II

Lecture 29 - OOAD - III

**NPTEL : Physics I - Oscillations and Waves (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. S. Bharadwaj**

- Lecture 1 - Simple Harmonic Oscillators
- Lecture 2 - Damped Oscillator - I
- Lecture 3 - Damped Oscillator - II
- Lecture 4 - Oscillator With External Forcing - I
- Lecture 5 - Oscillator With External Forcing
- Lecture 6 - Resonance
- Lecture 7 - Coupled Oscillations
- Lecture 8 - Sinusoidal Plane Waves - I
- Lecture 9 - Electromagnetic waves - I
- Lecture 10 - Electromagnetic Waves - II
- Lecture 11 - The Vector Nature of Electromagnetic Waves
- Lecture 12 - The Electromagnetic Spectrum
- Lecture 13 - The Electromagnetic Spectrum - II
- Lecture 14 - Interference - I
- Lecture 15 - Interference - II
- Lecture 16 - Interference - III
- Lecture 17 - Interference - IV
- Lecture 18 - Coherence
- Lecture 19 - Coherence
- Lecture 20 - Diffraction - I
- Lecture 21 - Diffraction - II
- Lecture 22 - Diffraction - III
- Lecture 23 - Diffraction - IV
- Lecture 24 - X-Ray Diffraction
- Lecture 25 - Beats
- Lecture 26 - The Wave Equation
- Lecture 27 - Solving the Wave Equation
- Lecture 28 - Waves
- Lecture 29 - Standing Waves
- Lecture 30 - Standing Waves
- Lecture 31 - Polarization



Lecture 32 - Compton Effect

Lecture 33 - Wave - Particle Duality

Lecture 34 - Wave - Particle Duality

Lecture 35 - Probability Amplitude

Lecture 36 - Probability

Lecture 37 - Schrodinger Wave Equation

Lecture 38 - Measurements

Lecture 39 - Particle in a Potential

Lecture 40 - Potential Well

Lecture 41 - Potential Well

Lecture 42 - Potential Well

Lecture 43 - Quantum Tunneling

Lecture 44 - Quantum Tunneling

**NPTEL : Strategic Management (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. Kalyan Chakravarti**

Lecture 1 - Strategy: Philosophy;Competition;Competitive Advantage - Part - I

Lecture 2 - Strategy: Philosophy;Competition;Competitive Advantage - Part - II

Lecture 3 - Case Study - Group Presentation on Case - I (Baddi's Solvent)

Lecture 4 - Case Study - Group Presentation on Case - II

Lecture 5 - Case Study - Group Presentation on Case - III

Lecture 6 - Case Study - Group Presentation on Case - IV Form

Lecture 7 - Strategy: Implementation in Organizations

Lecture 8 - Strategy: Design: Process: Managing Strategic Change

Lecture 9 - Case Study: The House of Tata

Lecture 10 - Case Study: The House of Tata

Lecture 11 - Group Presentation - II

**NPTEL : Basic Electronics and Lab (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. T.S. Natarajan**

Lecture 1 - Introduction to Basic Electronics

Lecture 2 - Electronic Devices 1

Lecture 3 - Electronics Devices II Resistor in series and parallel

Lecture 4 - Some Useful Laws in Basic Electronics

Lecture 5 - Some Useful Theorems in Basic Electronics

Lecture 6 - Semi Conductor Diodes

Lecture 7 - Applications of Diodes

Lecture 8 - Wave Shaping using Diodes

Lecture 9 - Zener Diode Characteristics

Lecture 10 - Transistors

Lecture 11 - Transistor Biasing - Common Emitter Circuits, Fixed Bias, Collector to base Bias

Lecture 12 - Transistor Biasing - Emitter Current Bias, Thermal Stability (RC Coupled Amplifier)

Lecture 13 - Basic Characteristic of an Amplifier - Simple Transistor model, Common emitter Amplifier

Lecture 14 - Hybrid Equivalent Circuit, H-Parameters

Lecture 15 - Circuit Analysis using H-Parameters

Lecture 16 - Frequency Response of Amplifiers

Lecture 17 - Frequency Analysis

Lecture 18 - Power Amplifiers

Lecture 19 - Differential Amplifiers Circuit

Lecture 20 - Integrated Chip

Lecture 21 - Typical Characteristic of Operation Amplifier

Lecture 22 - Four Types of Feed Back

Lecture 23 - Four Types of Feed Back

Lecture 24 - Mathematical Operations

Lecture 25 - Mathematical Operations

Lecture 26 - Mathematical Operations

Lecture 27 - Characteristics of Operation Amplifier

Lecture 28 - Characteristics of Operation Amplifier

Lecture 29 - Characteristics of Operation Amplifier

Lecture 30 - Inverter/Non-Inverter Circuits

Lecture 31 - Applications of Op Amps

Lecture 32 - Non-Linear Op Amp circuits

Lecture 33 - Applications of Op Amps

Lecture 34 - Active Diode Circuits

Lecture 35 - Oscillators

Lecture 36 - Logarithmic and Anti-Logarithmic Amplifier

Lecture 37 - Filters

Lecture 38 - Unit Junction Transistor

Lecture 39 - Silicon Controlled Rectifier

Lecture 40 - Field Effect Transistor

**NPTEL : Classical Physics (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. V. Balakrishnan**

- Lecture 1 - Introduction
- Lecture 2 - Newtonian mechanics
- Lecture 3 - Dynamics in phase space
- Lecture 4 - Linear dynamical systems
- Lecture 5 - Autonomous dynamical systems (Part 1)
- Lecture 6 - Autonomous dynamical systems (Part 2)
- Lecture 7 - Lagrangian formalism
- Lecture 8 - Summary of classical electromagnetism
- Lecture 9 - Charged particle in an electromagnetic field
- Lecture 10 - Hamiltonian dynamics (Part 1)
- Lecture 11 - Hamiltonian dynamics (Part 2)
- Lecture 12 - Hamiltonian dynamics (Part 3)
- Lecture 13 - Dynamical symmetry (Part 1)
- Lecture 14 - Dynamical symmetry (Part 2)
- Lecture 15 - Randomness in phase space; chaos
- Lecture 16 - Discrete-time dynamics: maps (Part 1)
- Lecture 17 - Discrete-time dynamics: maps (Part 2)
- Lecture 18 - Problems and solutions (Part 1)
- Lecture 19 - Problems and solutions (Part 2)
- Lecture 20 - Classical statistical mechanics: Introduction
- Lecture 21 - Some probability distributions; isolated system
- Lecture 22 - The microcanonical ensemble
- Lecture 23 - Thermodynamics
- Lecture 24 - The canonical ensemble
- Lecture 25 - Connection between statistical mechanics and ther-modynamics
- Lecture 26 - Probability distributions
- Lecture 27 - Probability distributions (concl.). Phase transitions (Part 1)
- Lecture 28 - Phase transitions (Part 2)
- Lecture 29 - Phase transitions (Part 3)
- Lecture 30 - Phase transitions (Part 4); misc. topics
- Lecture 31 - Problems and solutions (Part 3)

[Lecture 32 - Continuous groups in physics \(Part 1\)](#)

[Lecture 33 - Continuous groups in physics \(Part 2\)](#)

[Lecture 34 - Continuous groups in physics \(Part 3\)](#)

[Lecture 35 - Noether's Theorem. Special Relativity \(Part 1\)](#)

[Lecture 36 - Special Relativity \(Part 2\)](#)

[Lecture 37 - Special Relativity \(Part 3\)](#)

[Lecture 38 - Special Relativity \(Part 4\)](#)

**NPTEL : Engineering Chemistry I (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. K. Mangala Sunder**

Lecture 1 - Introduction to Chemistry & Quantum Chemical Mechanics

Lecture 2 - Particle in a box (one and two dimensions)

Lecture 3 - Particle in a box (One and Two Dimensions) Continued

Lecture 4 - Harmonic Oscillator and Molecular Vibration

Lecture 5 - Harmonic Oscillator (Continued)

Lecture 6 - Hydrogen Atom - Radial Solution

Lecture 7 - Hydrogen Atom Part III Angular Solutions

Lecture 8 - Hydrogen Atom - Angular Solutions (Continued)

Lecture 9 - Hydrogen Atom - Angular Solutions (Continued)

Lecture 10 - Oppenheimer Approximation and Superposition

**NPTEL : Numerical Methods and Programing (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. P.B. Sunil Kumar**

- Lecture 1 - Programing Basics
- Lecture 2 - Introduction to Pointers
- Lecture 3 - Pointers And Arrays
- Lecture 4 - External Functions and Argument Passing
- Lecture 5 - Representation of Numbers
- Lecture 6 - Numerical Error
- Lecture 7 - Error Propagation and Stability
- Lecture 8 - Polynomial Interpolation-1
- Lecture 9 - Polynomial Interpolation-2
- Lecture 10 - Error In Interpolation Polynomial
- Lecture 11 - Polynomial Interpolation
- Lecture 12 - Cubic Spline Interpolation
- Lecture 13 - Data Fitting : Linear Fit
- Lecture 14 - Data Fitting : Linear Fit
- Lecture 15 - Data Fitting : Non Linear Fit
- Lecture 16 - Matrix Elimination and Solution
- Lecture 17 - Solution To Linear Equations
- Lecture 18 - Matrix Elimination
- Lecture 19 - Eigen Values of A Matrix
- Lecture 20 - Eigen Values And Eigen Vectors
- Lecture 21 - Solving NonLinear Equations
- Lecture 22 - Solving NonLinear Equations Newton Raphson Method
- Lecture 23 - Methods For Solving NonLinear Equations
- Lecture 24 - System of NonLinear Equations
- Lecture 25 - Numerical Derivations
- Lecture 26 - High order Derivatives From Difference Formula
- Lecture 27 - Numerical Integration - Basic Rules
- Lecture 28 - Comparison of Different Basic Rules
- Lecture 29 - Gaussian Rules
- Lecture 30 - Comparison of Gaussian Rules
- Lecture 31 - Solving Ordinary Differential Equations

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[Lecture 32 - Solving ordinary differential equations](#)

[Lecture 33 - Adaptive step size Runge Kutta scheme](#)

[Lecture 34 - Partial Differential Equations](#)

[Lecture 35 - Explicit and Implicit Methods](#)

[Lecture 36 - The Crank - Nicholson Scheme For Two Spatial](#)

[Lecture 37 - Fourier Transforms](#)

[Lecture 38 - Fast Fourier Transforms](#)

**NPTEL : Quantum Physics (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. V. Balakrishnan**

Lecture 1 - Introduction to Quantum Physics;Heisenberg's uncertainty principle

Lecture 2 - Introduction to linear vector spaces

Lecture 3 - Characteristics of linear vector spaces

Lecture 4 - Functions in a linear vector space

Lecture 5 - Linear operations in a linear vector space and their eigenvalues

Lecture 6 - Classical Vs Quantum Mechanics

Lecture 7 - Quantum Physics

Lecture 8 - Quantum Physics

Lecture 9 - Quantum Physics

Lecture 10 - Quantum Physics

Lecture 11 - Quantum Physics

Lecture 12 - Quantum Physics

Lecture 13 - Quantum Physics

Lecture 14 - Quantum Physics

Lecture 15 - Quantum Physics

Lecture 16 - Quantum Physics

Lecture 17 - Quantum Physics

Lecture 18 - Quantum Physics

Lecture 19 - Quantum Physics

Lecture 20 - Quantum Physics

Lecture 21 - Quantum Physics

Lecture 22 - Quantum Physics

Lecture 23 - Quantum Physics

Lecture 24 - Quantum Physics

Lecture 25 - Quantum Physics

Lecture 26 - Quantum Physics

Lecture 27 - Quantum Physics

Lecture 28 - Quantum Physics

Lecture 29 - Quantum Physics

Lecture 30 - Quantum Physics

Lecture 31 - Quantum Physics



**NPTEL : Engineering Physics I (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. Rajdeep Chatterjee, Prof. B.K. Patra, Prof. M.K. Srivastava, Prof. G.D. Verma**

Lecture 1 - Introduction

Lecture 2 - Malus law & Superposition of ways

Lecture 3 - Double Refraction

Lecture 4 - Interference of polarized light

Lecture 5 - Optical Activity

Lecture 6 - Introduction

Lecture 7 - Stationary Waves & Reflection, Refraction and Diffraction

Lecture 8 - Ultrasonics

Lecture 9 - Acoustics of Buildings - Part I

Lecture 10 - Acoustics of Buildings - Part II

Lecture 11 - Interference of light Part-1

Lecture 12 - Interference of light Part-2

Lecture 13 - Interference of light Part-3

Lecture 14 - Interference by Division of Wave front

Lecture 15 - Interference by Division of Amplitude

Lecture 16 - Coherence and Application of Interference

Lecture 17 - Diffraction Part-1

Lecture 18 - Diffraction Part-2

Lecture 19 - Diffraction Part-3

Lecture 20 - Diffraction by a circular aperture

Lecture 21 - Kinetic theory of gases - Part-1

Lecture 22 - Kinetic theory of gases - Part-2

Lecture 23 - Maxwellian distribution law of velocity - Part-1

Lecture 24 - Maxwellian distribution law of velocity - Part-2

Lecture 25 - Maxwellian distribution law of velocity - Part-3

Lecture 26 - Vanderwaal's equation of states - Part-1

Lecture 27 - Vanderwaal's equation of states - Part-2

Lecture 28 - Vanderwaal's equation of states - Part-3

Lecture 29 - Fluid Mechanics - Part-1

Lecture 30 - Fluid Mechanics - Part-2

Lecture 31 - Introduction of special relativity

Lecture 32 - Consequences of special relativity-1

Lecture 33 - Consequences of special relativity-2

Lecture 34 - Consequences of special relativity-3

Lecture 35 - Consequences of special relativity-4

Lecture 36 - Consequences of special relativity-5

Lecture 37 - Introduction

Lecture 38 - Image formation by lenses

Lecture 39 - Lens aberrations - Part I

Lecture 40 - Lens aberrations - Part II

**NPTEL : Mathematics II (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Dr. Sunita Gakkhar, Prof. H.G. Sharma, Dr. Tanuja Srivastava**

Lecture 1 - Complex Integration

Lecture 2 - Contour Integration

Lecture 3 - Cauchy's Integral Theorem

Lecture 4 - Cauchy's Integral Formula

Lecture 5 - Application of Cauchy Integral Formula

Lecture 6 - Zeros, Singularities and Poles

Lecture 7 - Residue Integration Method

Lecture 8 - Residue Theorem

Lecture 9 - Evaluation of Real Integrals

Lecture 10 - Evaluation of Real Improper Integrals-1

Lecture 11 - Evaluation of Real Improper Integrals-2

Lecture 12 - Evaluation of Real Improper Integrals-3

Lecture 13 - Evaluation of Real Improper Integrals-4

Lecture 14 - Evaluation of Real Integrals - Revision

Lecture 15 - Matrix Algebra Part - 1

Lecture 16 - Matrix Algebra Part - 2

Lecture 17 - Determinants Part - 1

Lecture 18 - Determinants Part - 2

Lecture 19 - Solution of System Equation

Lecture 20 - Linear Algebra Part - 1

Lecture 21 - Linear Algebra part - 2

Lecture 22 - Linear Algebra Part - 3

Lecture 23 - Linear Algebra Part - 4

Lecture 24 - Inner Product

Lecture 25 - Linear Transformation Part - 1

Lecture 26 - Linear Transformation Part - 2

Lecture 27 - Eigenvalues Eigenvectors Part - 1

Lecture 28 - Eigenvalues Eigenvectors Part - 2

Lecture 29 - Quadratic Forms

Lecture 30 - Diagonalization Part - 1

Lecture 31 - Diagonalization Part - 2

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[Lecture 32 - Solution of System of Linear Equation](#)

[Lecture 33 - Functions of Complex Variables Part - 1](#)

[Lecture 34 - Functions of Complex Variables Part - 2](#)

[Lecture 35 - Taylor Series](#)

[Lecture 36 - Laurent Series](#)

[Lecture 37 - Rank of a Matrix](#)

[Lecture 38 - Complex Numbers Their Geometrical Representation](#)

**NPTEL : Mathematics III (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. P.N. Agrawal, Dr. Tanuja Srivastava**

- Lecture 1 - Solution of ODE of First Order and First Degree
- Lecture 2 - Linear Differential Equations of the First Order
- Lecture 3 - Approximate Solution of An Initial Value
- Lecture 4 - Series Solution of Homogeneous Linear I
- Lecture 5 - Series Solution of Homogeneous Linear II
- Lecture 6 - Bessel Functions and Their Properties
- Lecture 7 - Bessel Functions And Their Properties (Continued..)
- Lecture 8 - Laplace Transformation
- Lecture 9 - Laplace Transformation (Continued..)
- Lecture 10 - Applications Of Laplace Transformation
- Lecture 11 - Applications Of Laplace Transformation (Continued..)
- Lecture 12 - One Dimensional Wave Equation
- Lecture 13 - One Dimensional Heat Equation
- Lecture 14 - Introduction to Differential Equation
- Lecture 15 - First Order Differential Equations and Their Geometric Interpretation
- Lecture 16 - Differential Equations of First Order Higher Degree
- Lecture 17 - Linear Differential Equation of Second Order-Part - 1
- Lecture 18 - Linear Differential equation of Second Order-Part - 2
- Lecture 19 - Euler-Cauchy Theorem
- Lecture 20 - Higher Order Linear Differential Equations
- Lecture 21 - Higher Order Non homogeneous Linear Equations
- Lecture 22 - Boundary Value Problems
- Lecture 23 - Sturm Liouville boundary Value Problem
- Lecture 24 - Fourier Series-Part - 1
- Lecture 25 - Fourier Series-Part - 2
- Lecture 26 - Convergence of the Fourier Series
- Lecture 27 - Fourier Integrals
- Lecture 28 - Fourier Transforms
- Lecture 29 - Partial Differential Equation
- Lecture 30 - First Order Partial Differential Equation
- Lecture 31 - Second Order Partial Differential Equations - I



Lecture 32 - Second Order Partial Differential Equations - II

Lecture 33 - Solution of One Dimensional Wave Equation

Lecture 34 - Solution of HomogeneousNon Homogeneous Equations

Lecture 35 - Fourier Integral Transform Method for Heat Equation

Lecture 36 - Three Dimensional Laplace Equation

Lecture 37 - Solution of Drichlet Problem

Lecture 38 - Numerical Method for Laplace Poisson equation

Lecture 39 - ADI Method for Laplace and Poisson Equation

**NPTEL : Concept of Management and Evolution of Management Thought (Basic Courses (Semester 1 and 2))**

**Co-ordinators : Prof. K.B. Akhilesh**

- Lecture 1 - Introduction - Concept of Management
- Lecture 2 - Lecture 2
- Lecture 3 - Management By Objectives
- Lecture 4 - Organizing & Organization
- Lecture 5 - Organizing - II
- Lecture 6 - Coordinating
- Lecture 7 - Communication - I
- Lecture 8 - Communication - II
- Lecture 9 - Leadership
- Lecture 10 - Controlling
- Lecture 11 - Motivation and Organization Culture
- Lecture 12 - Japanese Management
- Lecture 13 - Comparison of Japanese and American Management
- Lecture 14 - Managerial Functions in International Business
- Lecture 15 - Marketing Functions: Channels of Distribution
- Lecture 16 - Management and Society
- Lecture 17 - Social Responsibility and Ethics - II
- Lecture 18 - Functions of Personnel Management
- Lecture 19 - Manpower Planning
- Lecture 20 - Selection - I
- Lecture 21 - Selection - II
- Lecture 22 - Performance Appraisal - I
- Lecture 23 - Performance Appraisal - II
- Lecture 24 - Training and Development - I
- Lecture 25 - Training and Development - II
- Lecture 26 - Job Design and Payment Systems - I
- Lecture 27 - Job Design and Compensation Systems
- Lecture 28 - Organizational Development - I
- Lecture 29 - Organizational Development - II
- Lecture 30 - Organization Theory - I
- Lecture 31 - Organization Theory - II

[Lecture 32 - Group Dynamics - I](#)

[Lecture 33 - Group Dynamics - II](#)

[Lecture 34 - Group Dynamics - III](#)

[Lecture 35 - Conflict Management - I](#)

[Lecture 36 - Conflict Management - II](#)

[Lecture 37 - Managing Creativity and Innovation](#)

[Lecture 38 - Creativity and Managing Innovation Process - II](#)

[Lecture 39 - Stress Management - I](#)

[Lecture 40 - Stress Management - II](#)