

**NPTEL : Nano structured materials-synthesis, properties, self assembly and applications (Nanotechnology)**

**Co-ordinators : Prof. A.K. Ganguli**

Lecture 1 - Introduction to Nanotechnology

Lecture 2 - Introduction to Nanotechnology (Continued...)

Lecture 3 - Synthetic Methodologies

Lecture 4 - Synthetic Methodologies (Continued...)

Lecture 5 - Synthetic Methodologies (Continued...)

Lecture 6 - Synthetic Methodologies (Continued...)

Lecture 7 - Synthetic Methodologies (Continued...)

Lecture 8 - Synthetic Methodologies (Continued...)

Lecture 9 - Template Methods - I

Lecture 10 - Template Methods - II

Lecture 11 - Spray Pyrolysis

Lecture 12 - V-L-S Method

Lecture 13 - Lithography - I

Lecture 14 - Lithography - II

Lecture 15 - Fullerenes and Carbon Nanotubes - I

Lecture 16 - Fullerenes and Carbon Nanotubes - II

Lecture 17 - Fullerenes and Carbon Nanotubes - III

Lecture 18 - Metal and Metal Oxide Nanowires - I

Lecture 19 - Metal and Metal Oxide Nanowires - II

Lecture 20 - Metal and Metal Oxide Nanowires - III

Lecture 21 - Self Assembly of Nanostructures - I

Lecture 22 - Self Assembly of Nanostructures - II

Lecture 23 - Self Assembly of Nanostructures - III

Lecture 24 - Core Shell Nanostructures - I

Lecture 25 - Core Shell Nanostructures - II

Lecture 26 - Core Shell Nanostructures - III

Lecture 27 - Nanocomposites - I

Lecture 28 - Nanocomposites - II

Lecture 29 - Photocatalysis - I

Lecture 30 - Photocatalysis - II

Lecture 31 - Photocatalysis - III

[Lecture 32 - Dielectric Properties - I](#)

[Lecture 33 - Dielectric Properties - II](#)

[Lecture 34 - Magnetic Properties - I](#)

[Lecture 35 - Magnetic Properties - II](#)

[Lecture 36 - Magnetic Properties - III](#)

[Lecture 37 - Optical Properties - I](#)

[Lecture 38 - Optical Properties - II](#)

[Lecture 39 - Mechanical Properties](#)

[Lecture 40 - Concluding Lecture](#)

**NPTEL : Nanostructures and Nanomaterials: Characterization and Properties (Nanotechnology)**

**Co-ordinators : Dr. Anandh Subramaniam, Dr. Kantesh Balani**

Lecture 1 - Introduction to Nanomaterials

Lecture 2 - Introduction to Nanomaterials

Lecture 3 - Introduction to Nanomaterials

Lecture 4 - Introduction to Nanomaterials

Lecture 5 - Introduction to Nanomaterials

Lecture 6 - Introduction to Nanomaterials

Lecture 7 - Introduction to Nanomaterials

Lecture 8 - Introduction to Nanomaterials

Lecture 9 - Introduction to Nanomaterials

Lecture 10 - Introduction to Nanomaterials

Lecture 11 - Surface Effects and Physical properties of nanomaterials

Lecture 12 - Surface Effects and Physical properties of nanomaterials

Lecture 13 - Surface Effects and Physical properties of nanomaterials

Lecture 14 - Surface Effects and Physical properties of nanomaterials

Lecture 15 - Surface Effects and Physical properties of nanomaterials

Lecture 16 - Defect Structure & Mechanical Behaviour of Nanomaterials

Lecture 17 - Defect Structure & Mechanical Behaviour of Nanomaterials

Lecture 18 - Defect Structure & Mechanical Behaviour of Nanomaterials

Lecture 19 - Defect Structure & Mechanical Behaviour of Nanomaterials

Lecture 20 - Defect Structure & Mechanical Behaviour of Nanomaterials

Lecture 21 - Electrical, Magnetic and Optical Properties of Nanomaterials

Lecture 22 - Electrical, Magnetic and Optical Properties of Nanomaterials

Lecture 23 - Electrical, Magnetic and Optical Properties of Nanomaterials

Lecture 24 - Electrical, Magnetic and Optical Properties of Nanomaterials

Lecture 25 - Electrical, Magnetic and Optical Properties of Nanomaterials

Lecture 26 - Atomic Bonding

Lecture 27 - Overview of Nano structures and Nano materials

Lecture 28 - Carbon Nanostructures

Lecture 29 - Multi-Scale Hierarchy

Lecture 30 - Self Assembly

Lecture 31 - Nanomaterials in Nature: Bone

Lecture 32 - Surfaces and Interfaces

Lecture 33 - Non-wetting

Lecture 34 - Nanomaterials Science and Nanomanufacturing

Lecture 35 - Surface Adsorption Isotherms (Langmuir/Bet)

Lecture 36 - Reciprocal Lattice

Lecture 37 - Transmission Electron Microscopy

Lecture 38 - Transmission Electron Microscopy

Lecture 39 - Auger Electron Spectroscopy

Lecture 40 - X-Ray Photoelectron Spectroscopy (XPS)

Lecture 41 - Electron Energy Loss Spectroscopy (EELS)

Lecture 42 - Deformation Behavior of Nanomaterials

Lecture 43 - Fracture and Creep

Lecture 44 - Nanomechanics

Lecture 45 - Nanotribology