

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

NPTEL Video Course - Electronics and Communication Engineering - NOC:Nanophotonics, Plasmonics, and Metamaterials

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Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction to Nanophotonics and Plasmonics
- Lecture 2 - Introduction to Metamaterials and Metasurfaces
- Lecture 3 - Overview and current status
- Lecture 4 - Electromagnetic theory of light
- Lecture 5 - Electromagnetic properties of material
- Lecture 6 - Electromagnetic waves in dielectric media
- Lecture 7 - Polarization of light
- Lecture 8 - Reflection and refraction: Fresnel equations
- Lecture 9 - Absorption, dispersion and scattering of light
- Lecture 10 - Matrix theory of dielectric layered media
- Lecture 11 - 1D Photonic crystals
- Lecture 12 - Dispersion relation and photonic band structure
- Lecture 13 - Real and reciprocal lattices
- Lecture 14 - 2D and 3D Photonic crystals
- Lecture 15 - Emerging Applications of Photonic Crystals
- Lecture 16 - Optical properties of metals
- Lecture 17 - Surface Plasmon Polaritons (SPP): Fundamentals
- Lecture 18 - Applications of SPPs
- Lecture 19 - Localized surface plasmon resonance (LSPR)
- Lecture 20 - Plasmonic nanoparticles: Antenna and Waveguides
- Lecture 21 - Applications of LSPR
- Lecture 22 - Fundamentals of metamaterials
- Lecture 23 - Effective medium theories
- Lecture 24 - Single and Double-Negative Metamaterials
- Lecture 25 - Metamaterial Perfect absorbers
- Lecture 26 - Super lens, Hyperbolic Metamaterials and Hyper lens
- Lecture 27 - Tunable photonic metamaterial based devices
- Lecture 28 - Metasurfaces and Frequency selective surfaces
- Lecture 29 - Guided mode resonances (GMR)

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- Lecture 30 - Applications of metasurfaces and GMR devices
- Lecture 31 - Transformation Optics (TO) and Invisibility Cloaks
- Lecture 32 - Carpet cloaking and TO metamaterials
- Lecture 33 - Introduction to alternative materials
- Lecture 34 - Nanofabrication: Physical and Chemical methods
- Lecture 35 - Lithography and Pattern transfer
- Lecture 36 - Nanophotonic characterization methods