NPTEL Video Course - Electrical Engineering - NOC:Nanobiophotonics: Touching Our Daily Life

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Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - What is Nano Bio Photonics?
Lecture 2 - Why is Nano Bio Photonics?
Lecture 3 - Why do this?
Lecture 4 - Why Photonics?
Lecture 5 - Why Biology?
Lecture 6 - Nature of Light
Lecture 7 - Light-Matter Interactions
Lecture 8 - Introduction to Fluorescence
Lecture 9 - The Cell
Lecture 10 - The Central Dogma
Lecture 11 - Facts of Matter
Lecture 12 - Introduction to Nanotechnology
Lecture 13 - Nanotechnology: The art of small
Lecture 14 - Synthesis of Nanomaterials : Top-Down Approach
Lecture 15 - Applications of Nanomaterials in Photonics
Lecture 16 - Interaction of Light with Cells
Lecture 17 - Light-matter interactions in molecules (Basic of Spectroscopy)
Lecture 18 - Imaging for Biological Matters
Lecture 19 - Fluorophores and Fluorescence Microscopy Techniques
Lecture 20 - Primary Examples
Lecture 21 - Basics of Flow Cytometry - Part 1
Lecture 22 - Basics of Flow Cytometry - Part 2
Lecture 23 - Data manipulation and presentation
Lecture 24 - Application of Flow cytometry in Biology
Lecture 25 - Raman Assisted Flow cytometry
Lecture 26 - Genetic Code
Lecture 27 - Biosensing Background
Lecture 28 - Basics of Microarray Technology
Lecture 29 - DNA Microarray Technology

Lecture 30 - Protein Microarray Technology
Lecture 31 - Laser Principles and Operation
Lecture 32 - Nonlinear Optical Processes
Lecture 33 - In Vivo Photoexcitation
Lecture 34 - Light/Laser Activated Therapy
Lecture 35 - Laser Tissue Contouring
Lecture 36 - Metamaterials
Lecture 37 - Metamaterials as Biosensors
Lecture 38 - Biosensing with Optical Nano-Antennas
Lecture 39 - Nanoscale Chemical Imaging
Lecture 40 - Optical Tweezers
Lecture 41 - Introduction to Optogenetics
Lecture 42 - Controlling the Brain with Light
Lecture 43 - The Nervous System
Lecture 44 - The Neural Circuits
Lecture 45 - Optical Neuroimaging and Tomography
Lecture 46 - Functional Near-Infrared Spectroscopy (fNIRS) of the Brain
Lecture 47 - Neuro imaging with Light-Sheet Microscopy
Lecture 48 - Brain imaging with Two Photon Microscopy
Lecture 49 - Brain imaging with functional optoacoustic Imaging
Lecture 50 - Tomographic technique for Brain imaging
Lecture 51 - Optogenetic Modulation of Neural Circuits
Lecture 52 - Nanoparticles for Optical Modulation of Neuronal Behavior
Lecture 53 - Optical Stimulation of Neural Circuits in Freely Moving Animals
Lecture 54 - Higher Harmonic Generation Imaging for Neuropathology
Lecture 55 - Multi-Photon Nanosurgery
Lecture 56 - Bioinspired materials for photonics
Lecture 57 - Bioderived Materials
Lecture 58 - Bioinspired Materials
Lecture 59 - Biotemplates
Lecture 60 - Summary and Revisiting Few Topics