

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

NPTEL Video Course - Metallurgy and Material Science - Introduction to Biomaterials

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Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to basic concepts of Biomaterials Science; Salient properties of important material
- Lecture 2 - Manufacturing and properties of metals, ceramics, polymers and composites
- Lecture 3 - Concept of biocompatibility, host response, structure-property of biological cell
- Lecture 4 - Structure and properties of cells, protein and cellular adaptation process
- Lecture 5 - Cell-I
- Lecture 6 - Cell-II
- Lecture 7 - Cell Migration and Cell Division and cell death
- Lecture 8 - Cell Differentiation and Cell Death
- Lecture 9 - Cell Apoptosis-I
- Lecture 10 - Cell Apoptosis-II
- Lecture 11 - Structure and properties of Protein; cell - material interaction
- Lecture 12 - Assessment of biocompatibility of biomaterials
- Lecture 13 - Biological testing (hemocompatibility, tribological testing)
- Lecture 14 - Structure and properties of bone as well as in vivo testing and histocompatibility assessment
- Lecture 15 - Important biometallic alloys
- Lecture 16 - Ti Alloy
- Lecture 17 - Co-Cr-Mo alloys
- Lecture 18 - Bioceramics
- Lecture 19 - Processing of Bioceramics
- Lecture 20 - Ceramics, Bioceramics and Glasses
- Lecture 21 - Sintering and mechanical properties of ceramics
- Lecture 22 - Fracture and toughening of ceramic composites
- Lecture 23 - Development of based bioceramic composites for hard tissue replacement
- Lecture 24 - Alternative phosphate materials, based composites with bactericidal property and glass ceramics
- Lecture 25 - Electrostatic Spraying of UHMWPE-HA-CNT composites
- Lecture 26 - Thin Films and Coatings
- Lecture 27 - Thermal Spray Coatings
- Lecture 28 - Biocompatibility of plasma sprayed CNT reinforced Hydroxyapatite biocomposite coatings
- Lecture 29 - Biocompatibility of Alumina and CNT reinforced Hydroxyapatite

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- Lecture 30 - Glass-ceramics for dental restoration applications
- Lecture 31 - Structure and properties of polymers
- Lecture 32 - Biodegradable polymers (Importance)
- Lecture 33 - Biodegradable polymers (Types)
- Lecture 34 - Mechanisms of Bioerosion
- Lecture 35 - External field and material interaction
- Lecture 36 - Tissue Engineering and wound healing
- Lecture 37 - Understanding Design Concepts of Bio-implants
- Lecture 38 - Understanding Design Concepts of Dental-implants
- Lecture 39 - Understanding Design Concepts of Orthopedic-implant