NPTEL Video Course - Metallurgy and Material Science - NOC:Fundamentals of optical and scanning electron micr

Subject Co-ordinator - Dr. S. Sankaran

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Properties of light, Image formation
Lecture 2 - Magnification and resolution
Lecture 3 - Depth of field, focus and field of view
Lecture 4 - Lens defects, filters and light microscopy introduction
Lecture 5 - Optical microscope demo., Bright field imaging, opaque specimen illumination
Lecture 6 - Opaque stop microscopy, Phase contrast microscopy
Lecture 7 - Dark field microscopy, Polarization microscopy
Lecture 8 - Differential interference contrast and fluorescence microscopy
Lecture 9 - Sample preparation techniques for optical microscopy
Lecture 10 - Tutorial problems
Lecture 11 - Tutorial problems (Continued...)
Lecture 12 - Introduction to scanning electron Microscopy
Lecture 13 - Lens aberrations, Object resolution, Image quality
Lecture 14 - Interaction between electrons and sample, Imaging capabilities, Structural analysis, Elemental a
Lecture 15 - SEM and its mode of operation, Effect of aperture size,Working distance,condenser lens strength
Lecture 16 - SEM and its mode of operation- continuation, Relation between probe current and probe diameter,
Lecture 17 - Factors affecting Interaction volume, Demonstration of SEM
Lecture 18 - Image formation and interpretation
Lecture 19 - Image formation and interpretation continued, EDS, WDS
Lecture 20 - Special contrast mechanisms, Monte Carlo simulations of Interaction volume
Lecture 21 - Electron channeling contrast imaging (ECCI), Electron back scattered diffraction (EBSD)-Theory &
Lecture 22 - Tutorial Problems on SEM