

NSE-843 Nanotechnology and Photovoltaics

Prerequisite: Nil

Category: Elective Course

Existing Course Contents	Proposed Course Contents
<ul style="list-style-type: none"> • Introduction to Photovoltaic Physics, Applications, and Technologies • Optical Properties of Nanostructures • Photovoltaic Device Physics on the Nanoscale • Nanostructured Organic Solar Cells • Recent Progress in Quantum Well Solar Cells • Nanowire- and Nanotube-Based Solar Cells • Semiconductor Nanowires: Contacts and Electronic Properties • Quantum Dot Solar Cells, Luminescent Solar Concentrators • Nanoparticles for Solar Spectrum Conversion • Nano-plasmonics for Photovoltaic Applications • Future Manufacturing Methods for Nanostructured Photovoltaic Devices 	<ul style="list-style-type: none"> • Introduction to semiconductors (electrical properties, charge carriers in doped nanomaterials), semiconductor devices • Introduction to photovoltaic physics • Photovoltaic device physics on the nanoscale: applications and technologies • Optical properties of nanostructures (light and electricity) • Luminescent solar concentrators • Nanomaterials for solar spectrum conversion • Nano-plasmonics for photovoltaic applications • Future manufacturing methods for nanostructured photovoltaic devices

Proposed Weekly Plan for the Concerned Faculty

Week /Lecture	Topic
1,2	Introduction to semiconductors (electrical properties, charge carriers in doped nanomaterials), semiconductor devices
3,4	Introduction to photovoltaic physics
5-7	Photovoltaic device physics on the nanoscale: applications and technologies
8-10	Optical properties of nanostructures (light and electricity)
11,12	Luminescent solar concentrators
13,14	Nanomaterials for solar spectrum conversion
15,16	Nano-plasmonics for photovoltaic applications
17	Future manufacturing methods for nanostructured photovoltaic devices