

# POLYMERS AND HYBRID COMPOSITES FOR THE APPLICATION IN ELECTRONIC AND PHOTONIC DEVICES

## Overview

This course is an in-depth introduction into various basic research on electronic and photonic processes in solid state layers of polymer and composite materials, electrical properties of polymer and organic materials, charge carrier transport, polymer composite morphology. In particular, the electron-hole transport in thin layers of various polymer materials will be discussed and a model of the transport of charge carriers, the increase of mobility in donor-acceptor composites also will be discussed. Research and development in organic and hybrid solar cells based on conductive polymer composites also will be discussed. After a short introduction on polymer composite material, he will discuss the following topics in detail as 1st part:

- Electronic processes in polymers and hybrid composites
- Polymers and their composites: the correlation between structure and electronic and photonic processes
- Electrical conductivity of polymers and hybrid composites
- Photoconductivity and related phenomena in polymers
- Photoconductivity and related phenomena in hybrid composites

The second part of the course will cover the topics

- Electronic and photonic devices based on polymers and hybrid composites
- Thin film electronic devices based on polymers and hybrid composites (part I)
- Thin film electronic devices based on polymers and hybrid composites (part II)
- Thin film optoelectronic/photovoltaic/ devices based on polymers and hybrid composites (part I)
- Thin film optoelectronic/photovoltaic/ devices based on polymers and hybrid composites (part II)
- Advanced technologies for manufacturing thin film devices (part I)
- Advanced technologies for manufacturing thin film devices (part II)

This technique can be adopted very easily by any company with little investment in India. So, it will be beneficial to the researcher, students as well as industries to get exposure from the course.

<b>Modules</b>	<b>A: Electronic processes in polymers and hybrid composites : November 05 – November 06, 2018</b> <b>B: Electronic and photonic devices based on polymers and hybrid composites : November 07 – November 09, 2018</b> <b>Number of participants for the course will be limited to fifty.</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>▪ Executives, Scientists, engineers and researchers from Industries, educational Institute and R &amp; D laboratories.</li> <li>▪ Students at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.</li> </ul>
<b>Fees</b>	<p>The participation fees for taking the course is as follows:</p> <p><b>Participants from abroad : US \$200</b></p> <p><b>Industry/ Research Organizations: Rs. 6000/-</b></p> <p><b>Academic Institutions : Rs. 4000/-</b></p> <p><b>Students/Scholars : Rs. 2000/- (Bonafide Letter is required from the Head of the Department/Institute)</b></p> <p><b>The above fee includes all instructional materials, computer use for tutorials, 24 hr free internet facility. Accommodation will be arranged twin sharing basis on payment basis.</b></p>

## The Faculty



**Professor Alexey (Aleksei) Tameev** is Leading Scientific Researcher at the laboratory for electronic and photonic processes in polymer nanocomposites, A.N. Frumkin Institute of Physical Chemistry and Electrochemistry of the Russian Academy of Sciences. His research interest is on electronic and photonic processes in solid state layers of polymer and composite materials for the application of electronic and solar cell devices.



**Dr. Aniruddha Mondal** is an Assistant Professor of Physics department NIT Durgapur. His research interest is Fabrication of III-V, III-N semiconductor material, 1d metal oxide semiconductor nanostructure using glancing angle deposition technique and fabrication of UV-Vis detector, plasmonic detector, hybrid semiconductor detectors.



**Dr. Rabindra Nath Barman** is an Assistant Professor of Department of Mechanical Engineering NIT Durgapur. His research interests are in Fluid Mechanics, Heat Transfer, Computational Fluid Dynamics (CFD), Modeling and Simulation.

## Course Co-ordinator:

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