

**Open Course Title:** Advanced Materials for Engineering Applications

**Target Students from Branches:** ECE/TCE/EEE/CSE/MTech/Civil/MCA

**Total duration of the course:** 25 Hours

**No. of Lecture hours:** 16 Hours

**No. of hands on / Practical:** 9 Hours

### **Abstract**

This course provides an introduction to the chemistry of advanced nanomaterials. These materials having unique properties which make them suitable candidates for technological improvement and thus can be used in various applications. Nanomaterials are cornerstones of nanoscience and nanotechnology. The use of revolutionized techniques helps us to improve the methods of preparation of such materials with improved functionality. Nanomaterials have already shown a significant influence in the field of battery technology, in catalysis, in biomedical and various other technologies. The students of all engineering branches can find application of these materials in their field.

Thus this open course will give our Engineering students an insight into the new techniques and advanced materials used in various fields. Also the students will get an exposure towards the improvement of basic techniques which already exist, by the use of new materials. Further, we give practical knowledge in the preparation and basic characteristics required for the identification of any material.

The lab sessions and the hands on session will be provided to the student participants to give a brief idea about the characterization of the different materials and to generate a clear overview of its potential applications.

### **Open Course Outcomes**

**At the end of the open course the students should be able to understand:**

**CO1: The various synthesis techniques used to prepare nanomaterials.**

**CO2: The nature and characterization of advanced materials.**

**CO3: To evaluate the use of advanced materials in technical applications.**

## Schedule

<b>Day 1: 12/02/2019</b>			
<b>Time</b>	<b>Topics</b>	<b>Resource Person Details</b>	<b>CO-PO Mapping</b>
9:30 am - 12:30 pm	Nano Electrowetting and its applications	Dr Jyoti Roy Choudhuri, Dept of Chemistry, BMSIT&M	
1:30 – 4:30 pm	Nanocomposites and its applications	Bincy Rose Vergis, Dept of Chemistry, BMSIT&M	
<b>Day 2: 13/02/2019</b>			
<b>Time</b>	<b>Topics</b>	<b>Resource Person Details</b>	<b>CO-PO Mapping</b>
9:30 am - 12:30 pm	Introduction to Corrosion and its prevention	Mrs Swetha G. A. Dept of Chemistry, BMSIT&M	
1:30 – 4:30 pm	Nanomaterials in LED Applications	Dr. Daruka Prasad Dept of Physics, BMSIT&M	
<b>Day 3: 14/02/2019</b>			
<b>Time</b>	<b>Topics</b>	<b>Resource Person Details</b>	<b>CO-PO Mapping</b>
9:30 am - 12:30 pm	Advanced Materials for Li-ion battery	Dr. Samrat Dayananda Sagar College	
1:30 – 4:30 pm	Improvement in the Li-ion battery technology	Dr. Ramakrishnappa, Dept of Chemistry, BMSIT&M	
<b>Day 4: 15/02/2019</b>			
<b>Time</b>	<b>Topics</b>	<b>Resource Person Details</b>	<b>CO-PO Mapping</b>
9:30 am - 12:30 pm	Advanced Nanomaterials for Engineering Applications	Dr. Dhananjaya. N, Dept of Physics, BMSIT&M	
1:30 – 4:30 pm	Nanomaterials for the improvement of battery technology	Dr. D.H. Nagaraju Dept of Chemistry, Jain University	
<b>Day 4: 16/02/2019</b>			
<b>Time</b>	<b>Topics</b>	<b>Resource Person Details</b>	<b>CO-PO Mapping</b>

9:30 am - 12:30 pm	Lab visit to Centre for Advanced Materials Research, BMSIT&M	Dr Jyoti Roy Choudhuri, Dept of Chemistry, BMSIT&M	
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