

Open Course Title: [Multifunctional, Hybrid and Nano-materials for Engineering Applications](#)

Target Students from Branches: [ECE/TCE/CSE/ISE/Mech](#)

Total duration of the course: [25 Hours.](#)

No. of Lecture hours: [12](#)

No. of hands on / Practical: [13](#)

Abstract

Title of the course: [Multifunctional, Hybrid and Nano-materials for Engineering Applications](#)

LEDs have been widely utilized in general lighting purpose. A wide range of CCT can be achieved by mixing lights from warm-white and cold-white LEDs. The RGB-tricolor LEDs can emit the pure white light, this open course will cover Introduction to Light Emitting Diode (LED) Principle of LED, LED Materials - Direct and Indirect Band Gaps, fabrication of WLED and their applications.

Superconductors fantastic materials which exhibits remarkable changes in electrical properties when they are taken to very low temperatures, which is used in the production very high magnetic fields which is used in high speed trains and also in MRI.

At the end of the course, hands on training on Synthesis of multifunctional hybrid materials, FTIR, UV visible and Ramann spectroscopic techniques and also hands on training on removal of dye from industrial water waste will be given to all the enrolled students. Also the students will be taken to a polymer industry where students can actually see how polymers finds applications in the manufacturing of automobile of components.

Open Course Details

CO1: Able to understand material properties and synthesis of materials

CO2: Able to apply characterization techniques

CO3: Able to analyze the materials for industrials applications

Schedule

Day 1:12/02/2019			
Time	Topics	Resource Person Details	CO-PO Mapping
9.00 am to 10.30 am	Multifunctional nanomaterial for LED lighting applications	Dr. Dhananjaya N, Associate Professor and Head, Physics	CO1- PO1, PO2,PO3
11.00 am to 12.30 pm	Physics of Nano electronics – Fundamentals to device level	Dr. Daruka Prasad, Assistant Professor, Physics	CO1, CO3
1.30 pm to 4.00 pm	Lab Session :Hands on training on Synthesis of multifunctional hybrid materials	Dr. Dhananjaya N, Associate Professor and Head, Physics	CO2- PO4,PO5

Day 2:13/02/2019			
Time	Topics	Resource Person Details	CO-PO Mapping
9.00 am to 10.30 am	Superconductors and their applications	Dr. R. Lokesh, Associate Professor, Physics.	CO1, CO3- PO1, PO5
11.00 am To 12.30 pm	Carbon hybrid materials for versatile device applications	Dr. Kavitha C, Assistant Professor, Physics	CO1, CO3
1.30 pm to 4.00 pm	Lab Session :Hands on training on FTIR, UV visible and Ramann spectroscopic techniques	Dr. Dhananjaya N, Associate Professor and Head, Physics And Dr. Kavitha C, Assistant Professor, Physics	CO3- PO5
Day 3:14/02/2019			
Time	Topics	Resource Person Details	CO-PO Mapping
9.00 am to 10.30 am	Carbon hybrid materials for versatile device applications	Dr. Kavitha C, Assistant Professor, Physics	CO1, CO3
11.00 am To 12.30 pm	Superconductors and their applications	Dr. R. Lokesh, Associate Professor, Physics.	CO1, CO3- PO1, PO5
1.30 pm to 4.00 pm	Lab Session :Hands on training on removal of dye from industrial water waste	Dr. Dhananjaya N, Associate Professor and Head, Physics	CO3- PO5,PO6, PO7
Day 4:15/02/2019			
Time	Topics	Resource Person Details	CO-PO Mapping
9.00 am to 10.30 am	Physics of Nano electronics – Fundamentals to device level	Dr. Daruka Prasad, Assistant Professor, Physics	CO1, CO3
11.30 am To 3.30 pm	Industry visit- Applications of polymers in the manufacturing of automobile of components.	Suprajit Automobiles, Industrial area, Doddaballapur.	CO3-PO3
Day 4:16/02/2019			
Time	Topics	Resource Person Details	CO-PO Mapping
9.00 am to 10.30 am	Materials for Sensors	Dr. T. Rama krishnappa, Associate Professor and Head, Chemistry	CO1, CO3
11.00 am to 12.30 pm	Assessment of students during the open course by conducting Quiz		