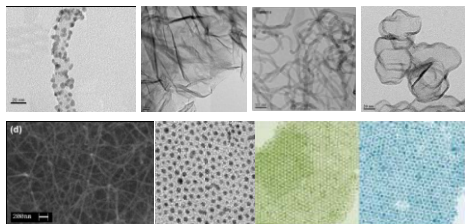


## About the course

This course is intended for the students, faculty and industry personnel who wish to acquire the practical knowledge of Raman, IR, UV-Vis and fluorescence spectroscopic measurement techniques, and use them to analyze different types of materials. These techniques are extensively used to understand the nature of bonding, structural disorder, crystallinity, and study the effects of physical and chemical stresses on materials' properties.

### Course Content

- i. Introduction to Spectroscopic Measurements
- ii. Basics of Raman, IR, UV-Vis, Fluorescence Techniques and their Applications
- iii. Instrumentation – Raman, IR, UV-Vis and Fluorescence Spectrometers
- iv. Sample Preparation Techniques
- v. Standard Measurements on Raman, IR, UV-Vis and Fluorescence Spectrometers
- vi. Characterization of Materials – Carbon Nanotubes, Graphene, Graphene Oxide, Metal Oxide Nanomaterials, Polymers and Composites
- vii. Hands-on Experience with Raman, IR, UV-Vis and Fluorescence Spectrometers



## Eligibility

M.Sc. (Chemistry/ Physics/ Materials Science)  
B.Tech./ M.Tech. (Chemical Engineering/  
Material Science/ Metallurgical Engineering/  
Nanotechnology/ Biotechnology)

### Course Fee

Students : Rs. 10,000  
Faculty/ Professional : Rs. 30,000  
(Fee includes breakfast and lunch.)

### Accommodation Charges

(Course duration + 2 days)  
Students : Rs. 500  
Faculty/ Professional : Rs. 1000

### For application form, please visit

<http://www.ncl-india.org/files/SDP/Default.aspx>

### MAILING ADDRESS FOR SENDING APPLICATIONS

**Coordinator**  
**CSIR-NCL Skill Development Program**  
**CMC Division**  
**CSIR- National Chemical Laboratory**  
**Dr. Homi Bhabha Road, PUNE-411008**

Email: [ncl.sdpc@ncl.res.in](mailto:ncl.sdpc@ncl.res.in)

(Applications will also be accepted by email)

**Council of Scientific & Industrial Research**



## CSIR – Integrated Skill Initiative



### Skill Development Course

## Spectroscopic Measurement Techniques – Raman, IR, UV-Vis and Fluorescence (SPECTEC)

Course Code –SDP\_NCL12

**24 September 2018 – 12 October 2018**

