

# CSIR-NCL Integrative Skill Initiative



## Skill Development Course in



### Polymer Characterisation by DSC, TGA, FTIR and UV-Vis spectrophotometer

**About the course:** Thermal Analysis and spectroscopic techniques are used in a various industries like polymer, pharmaceutical, food, materials etc. Thermo Gravimetric Analysis (TGA), Differential Scanning Calorimeter (DSC), Fourier Transform-Infrared Spectroscopy (FT-IR) and UV-Vis spectrophotometer is the essential and important laboratory techniques used for material characterization. FTIR is the most powerful method for determining chemical composition. Especially mid-IR region (400-4000  $\text{cm}^{-1}$ ) is very useful for analysis of organic molecules and of macromolecules like Polymers. UV-Vis can help in tracing out discrete molecular state which is strongly dependent on molecular structure, geometry and symmetry. DSC and TGA is used to find out melting/crystallization point, decomposition temperature of polymers. This course provides a glimpse of spectroscopic techniques, FT-IR and UV-Vis spectrometer and thermal techniques, DSC and TGA. After completing the course the candidate will be able to analysis and interpret the data and will acquire sufficient expertise.

**Course Content:** **FT-IR** - Introduction to FTIR, Components of FTIR, Michelson Interferometer, method development for sample analysis, live demonstration of sample run, Analysis and troubleshooting etc

**UV-VIS** - Introduction to UV-Vis spectroscopy, History and development, Components of UV-Vis Spectrophotometer, Sample method development, live demonstration of sample run, Analysis and troubleshooting etc

**DSC** - Introduction to DSC , different components of the system, melting and crystallization point, glass transition temperature, heat of fusion and heat of crystallization , determination of purity, liquid crystal transitions, hands on practical sessions, analysis of results and use of software, troubleshooting etc

**TGA** - Introduction to TGA, different components of the system, determination of filler percentage, decomposition temperature, activation energy, hands on practical sessions, analysis of results and use of software, troubleshooting etc

**Course Instructors:** Dr. Smita Mule, Sangeeta Hambir and Poorvi Purohit

**Course Code:** SDP-NCL

**Duration:** 10/01/2022 to 21/01/2022  
(2 Weeks)

**Number of Participants:** 10-15

**Eligibility:** M. Sc., M. Pharm., B. E.,  
B. Tech., M. E., M. Tech.

**Course Fees:**

- **Students:** Rs.5,000/-
- **Faculties:** Rs. 10,000/-
- **Industry Participants:** Rs. 20,000/-  
(Fee includes breakfast, tea and lunch)

**Accommodation (One week + 2 days):**

- **Students:** Rs. 500/-
- **Faculty/Professionals:** Rs. 1000/-

Participants can make payment either by DD or Online Transfer. For details see SDP website

### How to Apply

**Application form is available at**  
<http://www.ncl-india.org/files/SDP/Default.aspx>

### Mailing Address

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

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

**(Application will also be accepted by email)**

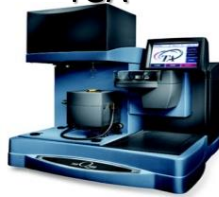
FT-IR Instrument



UV-Vis spectrometer



TGA



DSC

