

Content of the course: This programme includes the following modules (1) Spectroscopic ellipsometry which is a very important surface science technique for optical properties, very useful metrology tool in electronic industry, silicon fabrication labs, optical devices etc.. It is also immensely popular in the photonic, polymer, and ophthalmic industries as well. This technique can give the individual film thickness, bandgap, refractive index, surface roughness, and porosity for the thin films coated on a substrate. (2) Physical property measurement system: This tool is equipped with a 9 T superconducting magnet and has a temperature range of 2-400K and can measure dc/ac magnetization, hysteresis, thermoelectric figure of merit, thermal conductivity, Seebeck coefficient, Hall effect etc. (3) Differential thermogravimetric analysis. Thermogravimetric analysis and Differential scanning calorimetry techniques for a complete thermal analysis (4) Atomic force microscopy: This surface science tool can measure the surface roughness, particle size, elasticity, plasticity, adhesiveness etc. (5) Impedance spectroscopy: This tool can give capacitance, real and imaginary permittivity, loss tangent etc. for thin films and pellets in the range from micro Hz to 20 MHz. Student will learn how to make sample cell on their own for customized experiments.

Minimum eligibility: Postgraduate degree in science or undergraduate engineering streams

Course Fees:

Rs. 25,000/- (students/), Rs. 35,000/- (permanent staff in non-industry institutes), Rs. 45,000/- (industry sponsored candidate)

(Fee includes breakfast, and lunch)

Accommodation Charges (course duration plus two days)

Students- Rs.500/-

Faculty / Professionals- Rs.1000/-

For application form visit

([http://www.ncl-](http://www.ncl-india.org/files/SDP/Default.aspx)

[india.org/files/SDP/Default.aspx](http://www.ncl-india.org/files/SDP/Default.aspx))

Please mention batch number in application form.

MAILING ADDRESS FOR SENDING APPLICATION

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

(Application will also be accepted by email)



Council of Scientific and Industrial Research
National Chemical Laboratory

CSIR –Integrated Skill Initiative



**Skill development Course in
Advanced material
characterization techniques**

Course Code –

4th June to 29th June 2018

No. of participants per batch - 20

Selection: First come first serve basis

About the course

The course includes- basic training on spectroscopic ellipsometer, atomic force microscope, TGA/DTA. DSC, Physical property measurement system (PPMS) and impedance spectroscopy.

This extensive course will provide a basic training (including hands-on) on these advanced tools used for the material characterization including thermal, optical, ac/dc electrical, ac/dc magnetic, Hall measurements etc. The course will be conducted by Dr. Pankaj Poddar, Principal Scientist at NCL.