

## **Course Content: Advanced Analytical Techniques: Basic Principles and Applications for Quality Assessment of Drugs and Pharmaceuticals for Export**

### **Chromatographic Techniques**

- HPTLC: Principles and Applications
- HPLC: Principles and Applications in Analytical Assessment
- Hands-on Training on HPLC
- 2. Spectroscopic Techniques**
  - NMR Spectroscopy: Basic Principles and Pharmacopeial Analysis
  - Hands-on Training on NMR (600 MHz)
  - Mass Spectroscopy: Advanced Analytical Technique
  - LC-MS Q-TOF: Fundamentals and Applications
  - Hands-on Training on LC-MS/MS, LTQ-XL
  - Hands-on Training on HRMS
  - Fluorescence Techniques for Quality Management
  - Fluorescence Spectroscopy, FACS, ITC, SPR, MST, FTIR, CD, Polarimeter (Hands-on Training)
  - Electrophoresis and Capillary Electrophoresis
  - Spectroscopic Tools for Biopharmaceutical Analysis
- 3. Advanced Characterization Techniques**
  - Nanomaterials for Drug Delivery
  - XRD: Applications in Pharmaceuticals
  - Hands-on Training on XRD
  - Hands-on Training on DSC/TGA
  - Solid-state Characterization of Pharmaceuticals
- 4. Stability and Quality Management**
  - Stability Testing (Part I & II)
  - Laboratory Quality Management System (ISO/IEC 17025:2017 Overview)
- 5. Regulatory and Industrial Exposure**
  - Analytical Method Validation
  - Impurity Profiling
  - Role of Analytical Instruments in Food and Pharma Contaminants
  - Flagship Programme of India
  - Visit to Punjab Biotechnology Incubator, Mohali
  - Industrial Visit to Glenmark Labs Ltd., Baddi
  - Visit to NIPER Departments and Heritage Center