**GITAM SCHOOL OF PHARMACY**

**PhD Entrance Test Syllabus**

**PhD in Pharmacy: Pharmaceutical Analysis and Quality Assurance**

**Module I: Spectroscopic techniques:** UV-Visible spectroscopy, infrared (IR) spectroscopy, nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry (MS).

**Module II: Chromatography:** Analytical high-performance liquid chromatography (HPLC), preparative HPLC, Gas chromatography (GC), ion exchange chromatography, affinity chromatography, Gel chromatography and, capillary electrophoresis (CE), super critical fluid chromatography (SFC).

**Module III: Hyphenated techniques:** LC-MS and GC-MS.

**Module IV**: **Other analytical techniques:** X-ray diffraction (XRD), Differential scanning calorimetry (DSC), Thermogravimetric analysis (TGA) and differential thermal analysis (DTA).

**Module V: Stability studies:** Stability testing of pharmaceuticals, various stability tests, kinetic studies, shelf-life determination, thermal stability, formulation stability and impurity profiling.

**Module VI: Bioanalysis:** Sample preparation techniques, bioanalytical method validation, Pharmacokinetics, cytochrome P450-based drug interactions, drug interactions linked to transporters. microsomal assays, reaction phenotyping, enzyme inhibition, enzyme induction, metabolic stability, metabolite profiling, Caco-2 permeability assay, plasma protein binding, tissue binding and tissue distribution.

**Module VII: Quality assurance:** cGMP guidelines, ICH guidelines, documentation, Quality management systems, cleaning validation, calibration, validation, qualification.