



## **SAFI Institute of Advanced Study, (SIAS)**

### **Syllabus of Add-on course for Biotechnology**

#### **BIO-INSTRUMENTATION (ADBT01)**

- 1. General Biophysical methods** – Measurement of pH, Radioactive labeling & counting, Autoradiography, Flow cytometry. (4 hours)
- 2. Spectroscopic techniques-** Beer Lambert's law, Instrumentation for measuring the absorbance of visible light, Factors affecting the absorption properties of Chromophores. Types of Spectrophotometer- UV, visible, Infrared Spectrophotometer and FTIR. (8 hours)
- 3. Microscopy** – Light microscopy, Bright & Dark Field microscopy, Fluorescence microscopy, Phase Contrast microscopy, TEM & SEM. (6 hours)
- 4. Centrifugation** – Basic Principles of Centrifugation, Types of centrifugation. Instrumentation of Ultracentrifuge (Preparative, Analytical), Factors affecting Sedimentation velocity, Standard Sedimentation Coefficient. (7 hours)
- 5. Separation & Identification of Materials** - Concept of Chromatography (HPLC, GC and TLC). Basic concepts of NMR spectroscopy and X-Ray diffraction studies. (5 hours)

#### **References:**

1. Upadhyay., Biophysical Chemistry-, Himalaya Publication, Edition III
2. Ghatak, K.L., 2003. Techniques and Methods In Biology. PHI Learning Private Ltd. New Delhi.
3. Zubay.G.L., 1993. Biochemistry, 4 Edi. WmC. Brown Publishers.
4. Wandersee, James H. 1996. Bioinstrumentation: Tools for Understanding Life. ISBN-0-941212-23-8