

## ANALYTICAL INSTRUMENTATION

Code : EI 703

**Credits : 4**

### **Module I**

Humidity and Moisture, Viscosity and Consistency, Density and Specific gravity

Gas Analysis:

- (a) Thermal conductivity method
- (b) Heat of Reaction method

### **Module II**

Oxygen Analysis:

- (a) Paramagnetic method
- (b) Thermomagnetic method
- (c) Zirconia cell type
- (d) Continuous oxygen analysis with micro electrodes.

Spectroscopic methods: IR radiation absorption type, IR sources and detectors, their comparison, single channel and dual channel IR methods, Dispersive spectrometry using monochromaters, FT-IR Spectrometers.

### **Module III**

Liquid Analysis:

- (a) Electrodes-Ion selective, Molecular selective types- their variations and application.
- (b) Dissolved oxygen analysis cells
- (c) pH electrodes-pH analysis with circuits and applications
- (d) Conductivity cells – standards, circuits, applications
- (e) Polarography- apparatus, circuits and techniques-pulse polarography, applications
- (f) Absorption spectrometry in UV and visible range, sources and their spectral ranges, detectors, monochromaters
- (g) Colorimetry
- (h) Atomic spectral methods

### **Module IV**

Emission and Absorption methods of Visible, UV and X-rays - sources, detectors, techniques, sample preparation

Chromatography – GC, GLC, LC, HPLC types, columns, Detectors and techniques, applications

Methods using Nuclear Magnetic Resonance, Electron Spin Resonance – techniques and applications