

Elective course (Interdisciplinary)

EPH- 503: EXPERIMENTAL TECHNIQUES

UNIT-I

X-ray: Introduction to production of X-ray & X-ray spectra, Instrumentation, X-ray generation, collimators, filters, detectors, X-ray absorption methods, X-ray fluorescence methods, XF- Spectrometer (XFS),

Nuclear Magnetic Resonance (NMR) spectroscopy: basic principles, nuclear magnetic energy levels, magnetic resonance, NMR Spectrometer.

Electron Spin Resonance spectroscopy, ESR spectrometer, ESR spectra, Hyperfine interactions.

UNIT-II

Mass spectroscopy : principle, spectrometer, and its operation, resolution, Mass spectrum, applications.

Infrared Spectroscopy, correlation of IR spectra with molecular structure, Instrumentation.

Mosbauer Spectroscopy : Mosbauer effect, spectrometer, ^{57}Fe Mosbauer spectroscopy, nuclear hyperfine interactions.

References:

- (1) Instrumentation Methods of analysis : VIIth Edition, Willard Meritt, Dean,,Settle,CBS publishers.
- (2) Mosbauer Spectroscopy : Leopold May, Plenum Press, N.Y.
- (3) Neutron Diffraction : G.C. Becon
- (4) X-Ray diffraction : B.D. Culity, Edison Weisley
- (5) Radiation Detection & Measurment : Glenn F. Knoll