Gujarat Technological University

M. Pharm. Syllabus

Semester I

Paper Code - 910207

Subject: - Specialization Paper - II

Advanced Spectroscopic Techniques

Theory - Four hours per week; 6 Credits

Course Content: **Hours**

1. Basic principles, instrumentation and application of Chemiluminescence **05**
2. Basic principles, classification, instrumentation and application of LASER. **05**
3. Electron spin resonance (ESR) principle, instrumentation, correlation with proton magnetic resonance, derivative curves, interpretation and application. **08**
4. **Raman Spectroscopy**: Introduction, Principle and application of Raman Spectroscopy. **06**
5. **Photoacoustic Spectroscopy:** Principles, instrumentation and application. **05**
6. **Radiochemical Analysis:** Instruments used-analytical and screening, isotopic dilution, neutron activation and positron emission tomography (PET) **08**
7. **Nuclear Magnetic Resonance Spectroscopy:** Effect of stereochemistry on the spectrum, shift reagent. Introduction to the following techniques would be covered DEPT, APT, COSY, NOESY and INADEQUATE. **13**
8. **^{13}C Nuclear Magnetic Resonance (^{13}C - NMR)**
   Natural abundance of 13C, resolution and multiplicity FT mode, RF mode, uses of proton coupled, decoupled and off resonance decoupling techniques, deuterium substitution, chemical equivalence in peak assignment, chemical shift, Effect of substitution on chemical shifts, position of alkanes, alkenes, alkynes and benzene spin coupling and C13-H1 coupling **10**

Reference Books:

1. R. M. Silverstein and F. X. Webster, Spectrometric identification of Organic compounds, John Wiley & Sons, New York. (Latest edition).
2. William Kemp, Organic Spectroscopy, ELBS Mac millan, Hampshire, (U. K).
3. D. L. Pavia, G. M. Lampman and G. S. Kriz, Introduction to spectroscopy- A guide for students of Organic chemistry, Harcourt college publishers. (Latest edition).
4. D. H. Williams and I. Fleming, Spectroscopic methods in Organic chemistry, Tata Mc Graw Hill publishing company Ltd, New Delhi, India. (Latest edition).