

GUJARAT TECHNOLOGICAL UNIVERSITY

M.Pharm

PHARMACEUTICAL CHEMISTRY

SEMESTER: II

Subject Name: ADVANCED SPECTRAL ANALYSIS

Subject Code: MPC201T

Scope: This subject deals with various hyphenated analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are LC-MS,GC-MS,ATR-IR,DSC etc

Objectives: Upon completion of this course the student should be able to

1. Interpretation of the NMR, Mass and IR spectra of various organic compounds
2. Theoretical and practical skills of the hyphenated instruments
3. Identification of organic compounds

Sr No	Course Contents	Total Hrs
1	UV and IR spectroscopy: Woodward – Fieser rule for 1,3-butadienes, cyclic dienes and α , β -carbonyl compounds and interpretation of enones. ATR-IR, IR Interpretation of organic compounds	12
2	NMR spectroscopy: 1-D and 2-D NMR, NOESY and COSY, HECTOR, INADEQUATE techniques, Interpretation of organic compounds	12
3	Mass Spectroscopy Mass fragmentation and its rules, Fragmentation of important functional groups like alcohols, amines, carbonyl groups and alkanes, Meta stable ions, McLafferty rearrangement, Ring rule, Isotopic peaks, Interpretation of organic compounds	12
4	Chromatography: Principle, Instrumentation and Applications of the following: a) GC-MS b) GC-AAS c) LC-MS d) LC-FTIR e) LC-NMR f) CEMS g) High Performance Thin Layer chromatography h) Super critical fluid chromatography i) Ion Chromatography j) I-EC (Ion Exclusion Chromatography) k) Flash chromatography	12
5	A) Thermal methods of analysis Introduction, principle, instrumentation and application of DSC, DTA and TGA B) Raman Spectroscopy: Introduction, Principle, Instrumentation and Applications C) Biological standardization, bioassay, ELISA, Radio immuno assay of digitalis and insulin	12

REFERENCES:

1. Spectrometric Identification of Organic compounds - Robert M Silverstein, Sixth edition, John Wiley & Sons, 2004.
2. Principles of Instrumental Analysis - Douglas A Skoog, F. James Holler, Timothy A. Nieman, 5th edition, Eastern Press, Bangalore, 1998.
3. Instrumental methods of analysis - Willards, 7th edition, CBS publishers.
4. Organic Spectroscopy - William Kemp, 3rd edition, ELBS, 1991.
5. Quantitative analysis of Pharmaceutical formulations by HPTLC - P D Sethi, CBS Publishers, New Delhi.

6. Quantitative Analysis of Drugs in Pharmaceutical formulation - P D Sethi, 3rd Edition, CBS Publishers, New Delhi, 1997.
7. Pharmaceutical Analysis- Modern methods – Part B - J W Munson, Volume 11, Marcel Dekker Series