

KAHM UNITY WOMEN'S COLLEGE, MANJERI
PG DEPARTMENT OF CHEMISTRY
SYLLABUS FOR ADD ON COURSE, 2022-23

**CHE 05 CC07: "Structural Elucidation of Organic Molecule" For MSc
Chemistry students**

MODULE 1 (2 hr)

Introduction to structure elucidation

Chemical methods and physical methods. Spectroscopic methods

MODULE II (8 hr)

Ultraviolet and Infrared Spectrophotometry

The electromagnetic spectrum. Absorption of light: Beer-Lambert Law. UV-Visible spectroscopy.

Introduction. Types of vibrations. Hydrogen bond. Polyatomic molecules. Characteristic absorption of different functional groups. FTIR spectrophotometer. Preparation of the sample. Interpretation of IR spectra.

MODULE III (8 hr)

Introduction to Mass spectrometry

Introduction. Instrumentation. Ionization methods. Types of ions. Determination of molecular masses. Fragmentation of positive ions. General rules of fragmentation of organic molecules. Analysis of the mass spectrum. Representative examples.

MODULE IV (9 hr)

Introduction to Nuclear Magnetic Resonance spectroscopy

Basic principles of nuclear magnetic resonance. Spectrophotometers. Effects of chemical shift that influence NMR. Intensities of the bands. Reference substances. Solvents. Spin-spin coupling. The coupling constant. Relation between chemical shift-molecular structure. Complex spectra. Homotopic, enantiotopic and diastereotopic groups. Stereoisomery and NMR. Proton couplings with other nuclei. Double resonance experiments. Spin decoupling. NOE effect (Nuclear Overhauser Effect): Proximity in the 1H-1H space. Magnetic resonance of 13C. Decoupling techniques. 13C quantitative analysis. DEPT experiments. Spectral correlations

MODULE V (3 hr)

Practical applications of structure elucidation techniques

**Course Coordinator: Dr. Jamsheena V, Assistant Professor, KAHM Unity Women's
College, Manjeri**

References

Spectrometric identification of organic compounds" R.M. Silverstein, F.X. Webster, D.J. Kiemle. (Wiley, 7th Edition). . Specific: • "Nuclear Magnetic Resonance and Spectroscopy" J. B. Lambert, E. P. Mazzola (Pearson) • "Spin Dynami