4. Introduction to Mass Spectrometry: Instrumentation, Applications, and Strategies for Data Interpretation, 4th Edition J. Throck Watson, O. David Sparkman J. Wiley, October 2007.
5. Mass Spectrometry in Medicinal Chemistry Applications in Drug Discovery Wanner, Klaus / Höfner, Georg (eds.) Wiley-VCH, 2007.
6. Protein Sequencing and Identification Using Tandem Mass Spectrometry Michael Kinter and Nicholas E. Sherman J. Wiley, 2000.
7. Proteome Research: Mass Spectrometry (Principles and Practice) Peter James (Editor) Springer, 2000.

CHAO 509: ADVANCED NMR SPECTROSCOPY 2 CREDITS

UNIT I

NMR: Theory of Nuclear magnetic Resonance, quantum description of NMR, classical description of NMR, Types of NMR spectra, environmental effects of NMR Spectra, the chemical shift, Block diagram of an NMR spectrometer, Applications of proton NMR in qualitative and quantitative analysis (in general).

UNIT II

^{13}C and NMR Spectroscopy: CW and PFT techniques- types of CMR spectra- un decoupled – proton decoupled – off – resonance decoupled (SFORD) – selectivity decoupled and gated decoupled spectra. ^{13}Cchemical shifts – factors affecting the chemical shifts – Homonuclear (^{13}C ^{13}CJ) and heteronuclear (^{13}C – ^{1}H, ^{13}C – 2HJ) couplings.

UNIT III

Introduction to 2D- NMR: Classification of 2D experiments- 2DJ resolved spectroscopy- HOMO and HETERO- 2D – J resolved spectra; Correlation spectroscopy (COSY) - HOMO-COSY, HETERO – COSY, 2D – INADEQUATE and NOESY.

REFERENCE BOOKS:

1. Principles of Instrumental Analysis; D.A. Skoog Samnders college publishing, NY 1985 Fundamentals of molecular Spectroscopy; CN Banwell, TMH Edition, 1983
2. Coordination Chemistry; Burger
3. Instrumental Methods of Analysis; Willard, Merritt and Dean
4. Spectroscopic Identification of Organic Compounds; R. M. Silverstein, G.C. Bassler and T. E. Morrill
5. Spectroscopic Identification of Organic Compounds; R.M. Silverstein and Webster
6. NMR in Chemistry – A Multinuclear Introduction; William Kemp
7. 13 C NMR for Organic Chemists; G.C. Levy and G.L. Nelson
8. Understanding NMR Spectroscopy, Second Edition by James Keeler.

CHGO 500: DISSERTATION

The dissertation should comprise original research and is conducted either at the Goa University or with approval, in an outside institution or company. A dissertation is submitted for evaluation and an oral examination is also held.