

**Title: NMR in Biological Systems [3-0-0-6]**

**Content :**

1. Basics Concepts in NMR Spectroscopy
2. Analysis of one-dimensional (1D) NMR spectra of molecules
3. Introduction to Biological NMR
4. Basics of multidimensional 2D and 3D NMR Spectroscopy (NMR methods such as NOESY, TOCSY, Triple resonance NMR experiments etc.)
5. Analysis of 2D/3D NMR spectra of molecules
6. Methods to determine 3D Structures of Proteins and Nucleic acids by NMR spectroscopy
7. Special Applications: (a) Drug discovery, SAR by NMR, STD, Tr-NOEs (b) Gradients, Imaging and Diffusion (c) Biomolecular Interactions and Supramolecular assemblies. (d) MRS studies of metabolism in Animals and Human

**Texts / References:**

*References are incomplete; details as above must be included*

1. Levitt M.H., Spin Dynamics: Basics of Nuclear Magnetic Resonance
2. Kurt Wuthrich NMR of proteins and nucleic acids
3. Cavanagh John, Fairbrother Wayne J., Palmer III Arthur G., Skelton Nicholas J., Editors, Protein NMR Spectroscopy: Principles and Practice,
4. Chary KVR, Govil G. NMR in Biological Systems From molecules to Human