



Syllabus

MODULE : 1

1. Properties of neutron and its utilization for condensed matter - 1 Lecture
2. Neutron Sources, Neutron transport, beam lines - 2 Lectures
3. Basics of neutron scattering under Born Approximation, Correlation function, Scattering Law - 5 Lectures
4. Tutorial - 2 Lectures
5. Neutron Spectrometers and Neutron Detectors - 2 Lectures

MODULE : 2.A

1. Introduction to Detectors - 1 Lecture
2. Introduction to Magnetic Neutron Scattering - 1 Lecture
3. Differential cross-section for magnetic neutron scattering in dipole approximation, Magnetic form factor - 1 Lecture
4. Determination of magnetic structures by neutron diffraction - (i) - 1 Lecture

MODULE : 2.B

1. Determination of magnetic structures by neutron diffraction - (ii) - 1 Lecture
2. Elastic and Inelastic Magnetic Neutron Scattering - 1 Lecture
3. Tutorial - 2 Lectures
4. Polarized Neutron - 1 Lecture
5. Neutron Depolarization in Magnetic Materials - 1 Lecture
6. Fluctuation Dissipation Theorem and Dynamic correlation function - 1 Lecture
7. Neutron scattering from spin waves - 1 Lecture



Syllabus

MODULE : 3

- 1. Vibrational spectroscopy using Inelastic Neutron Scattering (INS) Lattice dynamics theory - 1 Lecture**
- 2. Inelastic and Quasi-elastic Neutron Scattering - 3 Lectures**
- 3. Tutorial on INS - 1 Lecture**
- 4. Stochastic dynamics using Quasi-elastic neutron scattering (QENS) Molecular dynamics simulation - 3 Lectures**
- 5. Tutorial on QENS - 1 Lecture**

MODULE : 4.A

- 1. Small-Angle Neutron and X-Ray Scattering Facilities - 1 Lecture**
- 2. Contrast Variation in Small-Angle Scattering - 1 Lecture**
- 3. Data Analysis Methods - 1 Lecture**
- 4. Applications to Soft Matter, Nanomaterials and Biology - 1 Lecture**
- 5. Tutorial - 1 Lecture**

MODULE : 4.B

- 1. Introduction to Neutron and x-ray Reflectometry - 1 Lecture**
- 2. Reflectometry facility and data analysis - 1 Lecture**
- 3. Investigation of depth dependent magnetic structure using polarized neutron reflectivity - 2 Lectures**
- 4. Tutorial - 1 Lecture**