

## **JCL 310 (Jan) 4:0**

### **Structure & Chemical Crystallography**

*Instructor: Sebastian C. Peter*

History of crystallography, structure of solids, defects in solids, concepts of symmetry, point groups and space groups, crystal lattices, elements of scattering theory, X-ray diffraction, diffraction principles, reciprocal space, Ewald construction, powder X-ray diffraction, XRD line broadening, Rietveld refinement in powder diffraction, single crystal X-ray diffraction methods, different method to grow good crystals, data collection and processing strategies, image plate and CCD detectors, intensity statistics, structure factor, phase problem in crystallography, Patterson and direct methods, electron density maps, structure refinement, structure data bases, limits of X-ray diffraction methods, synchrotron radiation, basics of neutron diffraction, basics of electron diffraction.

### **Reference Books:**

1. M F C Ladd, R A Palmer, Structure Determination by X- Ray
2. W. Massa, Crystal Structure Determination
3. G. H. Stout and L. H. Jensen, X-Ray Structure Determination: A Practical Guide
4. *William D. Callister*, Material Science and Engineering
5. *Elaine A. Moore and Lesley E. Smart*, Solid State Chemistry: An Introduction
6. *Anthony R. West*, Solid State Chemistry and its applications
7. *Theo Hahn*, International table of crystallography - Brief teaching edition of Volume A: Space-group symmetry