

**Curriculum and Credit Framework (CCF) - 2022, University of Calcutta**  
**Proposed distribution of syllabus and Class load**  
**Course: Chemistry Major, Semester-4**  
**Paper: CHEM-H-CC5-4-Th, Inorganic Chemistry**

Serial number	Number of lectures	Topic of the prescribed syllabus	Teaching faculty
1.	2	The approximations of the Molecular Orbital Theory	Dr. J. Gangopadhyay
2.	2	Linear combination of atomic orbitals (LCAO) (elementary pictorial approach): sigma and pi bonds and delta interaction, multiple bonding	Dr. J. Gangopadhyay
3.	2	Orbital designations: gerade, ungerade, HOMO, LUMO	Dr. J. Gangopadhyay
4.	4	MO diagrams of H <sub>2</sub> , Li <sub>2</sub> , Be <sub>2</sub> , B <sub>2</sub> , C <sub>2</sub> , N <sub>2</sub> , O <sub>2</sub> , F <sub>2</sub> , and their ions wherever possible	Dr. J. Gangopadhyay
5.	6	Heteronuclear molecular orbitals: CO, NO, NO <sup>+</sup> , CN <sup>-</sup> , HF, BeH <sub>2</sub> , CO <sub>2</sub> and H <sub>2</sub> O	Dr. J. Gangopadhyay
6.	2	Normalisation, Variation Principle, Bond properties: bond orders, bond lengths	Dr. J. Gangopadhyay
7.	2	Qualitative idea of valence bond and band theories.	Dr. J. Gangopadhyay
8.	2	Semiconductors and insulators, Fermi level concept	Dr. J. Gangopadhyay
9.	1	Defects in solids	Dr. J. Gangopadhyay
10.	2	Ion-dipole, Dipole-dipole, Dipole-induced dipole and instantaneous dipole interactions	
11.	1	Hydrogen bonding (theories of hydrogen bonding, valence bond treatment)	Dr. J. Gangopadhyay
12.	1	Receptor-guest interactions,	Dr. J. Gangopadhyay
13.	1	Effects of chemical force, melting and boiling points	Dr. J. Gangopadhyay
14.	2	Arrhenius concept, theory of solvent system (in H <sub>2</sub> O, NH <sub>3</sub> , SO <sub>2</sub> and HF), Bronsted-Lowry's concept, Lux Flood concept,	Dr. A. K. Barik
15.	2	Lewis's concept, group characteristics of Lewis acids	Dr. A. K. Barik
16.	1	Solvent levelling and differentiating effects. Relative strength of acids	Dr. A. K. Barik

17.	1	Pauling's rules	Dr. A. K. Barik
18.	2	HSAB principle.	Dr. A. K. Barik
19.	2	Proton transfer equilibria in water, pH, buffer.	Dr. A. K. Barik
20.	2	Acid-base neutralization curves; indicator, choice of indicators.	Dr. A. K. Barik
21.	2	Nuclear stability and nuclear binding energy.	Dr. J. Chakraborty
22.	2	Artificial radioactivity, fission, fusion and spallation	Dr. J. Chakraborty
23.	1	Radiocarbon dating	Dr. J. Chakraborty