

**CBCS Framework, University of Calcutta**  
**Proposed distribution of syllabus and Class load**  
**Course: CEMA, Semester-I**  
**Paper: CEMA-CC-1-1, Inorganic Chemistry**

Serial number	Number of lectures	Topic of the prescribed syllabus	Teaching faculty
1.	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, relative strength of acids, Lux-Flood concept	Dr. A. K. Barik
2.	2	Solvent levelling and differentiating effects. Pauling's rules	Dr. A. K. Barik
3.	2	Thermodynamic acidity parameters, Drago-Wayland equation. Superacids, Gas phase acidity and proton affinity	Dr. A. K. Barik
4.	3	HSAB principle. Acid-base equilibria in aqueous solution (Proton transfer equilibria in water), pH, buffer	Dr. A. K. Barik
5.	3	Acid-base neutralisation curves; indicator, choice of indicators	Dr. A. K. Barik
6.	2	Ion-electron method of balancing equation of redox reaction. Elementary idea on standard redox potentials with sign conventions, Nernst equation (with derivation).	Dr. J. Gangopadhyay
7.	3	Concept of formal potential, Influence of complex formation, precipitation and change of pH on redox potentials.	Dr. J. Gangopadhyay
8.	2	Feasibility of a redox titration, redox potential at the equivalence point, redox indicators.	Dr. J. Gangopadhyay
9.	2	Redox potential diagram (Latimer and Frost diagrams) of common elements and their applications	Dr. J. Gangopadhyay
10.	1	Disproportionation and comproportionation reactions (typical examples).	Dr. J. Gangopadhyay
11.	2	Solubility and solubility effect – common ion effect and their applications to the precipitation and separation of common metallic ions as hydroxides, sulfides, phosphates, carbonates, sulfates and halides.	Dr. J. Gangopadhyay
12.	3	Quantum numbers and their significance	Dr. J. Gangopadhyay
13.	2	Schrödinger's wave equation, significance of $\psi$ and $\psi^2$ .	Dr. J. Gangopadhyay

14.	2	Radial and angular wave functions for hydrogen atom. Radial and angular distribution curves	Dr. J. Gangopadhyay
15.	1	Shapes of <i>s</i> , <i>p</i> , <i>d</i> and <i>f</i> orbitals	Dr. J. Gangopadhyay
16.	2	Electroanalytical methods: Basic principle of pH metric, potentiometric and conductometric titrations. Techniques used for the determination of equivalence points. Techniques used for the determination of pK <sub>a</sub> values	Dr. J. Chakraborty
17.	6	Pauli's Exclusion Principle, Hund's rules and multiplicity, Exchange energy, Aufbau principle and its limitations, Ground state Term symbols of atoms and ions for atomic number upto 30.	Dr. J. Chakraborty