Admission Criteria for M.Sc. (Chemistry) course:

The candidates who have passed B.Sc. with Chemistry as one of the major subject at the final year with minimum of 55% in aggregate (50% for the reserve category candidates). The admission shall be done through written test conducted by the institute. The syllabus of the Entrance test is as follows:

Syllabus of the Entrance examination for M.Sc. (Chemistry) programme
(a) Inorganic Chemistry

3. Main group elements (s and p blocks): Chemistry with emphasis on group relationship and gradation in properties; structure of electron deficient compounds of main group elements and application of main group elements.
5. Organometallic compounds: Concept of hepticity, 18 electron rule. Carbonyl compounds of first row of transition metals.
6. Non aqueous solvents: General characteristics, reactions with reference to ammonis and liquid sulphur dioxide.
7. Acids and Bases: Lewis and HSAB concepts

(b) Organic Chemistry

1. Nomenclature of Organic compounds.
4. Aromaticity and Hückel's rule: Mono and bicyclic carbocyclic aromatic hydrocarbons and their electrophioic substitution reactions.
5. Synthetic chemistry: Methods of preparation and characteristic reactions of alkanes, alkenes, alkynes (including their cyclic analogues), arenes and their simple functional derivatives, such as alkyl, halo, nitro, hydroxyl, alkoxy, formyl, carboxyl (and carboxylic acid...

6. **Mechanism** (with stereochemistry): Aliphatic nucleophilic substitution, elimination, enolate reactions, Claisen condensation, esterification and ester hydrolysis, Cannizzaro reaction, benzoin condensation, Perkin reaction, Claisen rearrangement, Beckmann rearrangement, Wagner-Meerwein rearrangement.

7. **Carbohydrates**: Classification, nomenclature. Open and cyclic formulae. Chemistry of glucose.


9. **Heterocyclic chemistry**: Monocyclic 5- and 6-membered aromatic compounds with one hetero atom (S, O, N). Their nomenclature, electronic structure, aromaticity, characteristic properties and general reactions.

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**c) Physical chemistry**

1. **Atomic structure**: Fundamental particles. Bohr's theory of hydrogen atom; Wave-particle duality; Uncertainty principles; Schrodinger's wave equation; Quantum numbers, shapes of orbitals; Hund's rule and Pauli's exclusion principle.


4. **Chemical and Phase equilibria**: Law of mass action; $K_p$, $K_c$, $K_x$ and $K_n$; Effect of temperature on $K$; Ionic equilibria in solutions; pH and buffer solutions; Hydrolysis; Solubility product; Phase equilibria–Phase rule and its application to one-component and two-component systems; Colligative properties.


6. **Chemical kinetics**: Reactions of various order, Arrhenius equation, Collision theory; Theory of absolute reaction rate; Chain reactions - Normal and branched chain reactions; Enzyme kinetics; Photophysical and photochemical processes; Catalysis.

7. **Quantum chemistry**: Elementary quantum chemistry, state function, operators, eigen values and eigen functions.

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**d) Analytical Chemistry**

Classification of analytical methods. Performance characteristics of analytical methods. Errors and their types. Acid-base titrations and acid-base indicators, redox titrations, conductometric and potentiometric titrations.