First Year (I Semester)

Year	Semester	Course Code	Course Name	Theory/ Practical	Credit	Total Credit	Min. Counce lling hrs
MINOR							
I	**I**	CHE(N)-120	Basics of Chemistry	Theory	3	**4**	**9**
		CHE(N)-120L	Laboratory Course/Work	practical	1		**3**

SEMESTER-I
MINOR: THEORY

Programme:	**Year: I**	**Semester-I**
Course Code: CHE(N)-120		
Course Name: Basics of Chemistry		
Credit: 3		
Max. Marks: 70+30 =100		

Course Objective and Outcomes:

Learnes will gain an understanding of

- Molecular geometries, physical and chemical properties of the molecules.
- Current bonding models for simple inorganic and organic molecules in order to predict structures and important bonding parameters.
- It describes the factor affectinf the electron delocalization in the chemical bond through inductive, mesomeric, electromeric effect.
- It enables to understand the reactants, catalyst, enzyme
- The course will also strengthen the knowledge of students regarding complete picture of states of matter.

Syllabus Details

Block-I: Molecules and Bonding

Unit 1: Unit and dimentions

Introduction, basic units, derived unites, SI Prefixes. Grammatical Rules for Representing the SI Unites. Conversion of Non- SI unit to SI units

Unit 2: Atom and Molecules

Bohr's Atomic theory (only postulates), structure of an atom; nuclear particles, atomic number, mass number and Isotopes, Atomic orbitals, filling of electrons in various orbitals-Aufbau energy diagram, Pauli's Exclusion Principle, Hund's rule of maximum multiplicity

Unit 3: Molecules and bonding

Molecules and chemical formulae, molar mass and Avogadro's number, ionic bond and ionic compounds, Covalent compounds-bonding, VSEPR concept and geometry, Valence Bond theory, Hybridization

Unit 4: Electronegativity and polarization of covalent bond

Electronegativity and polarization of covalent bond, inductive, mesomeric, electromeric effect, hydrogen bonding and its significance

Block-II: Periodic Properties and Gaseous State

Unit 5: Periodic Properties

Periodic table and periodic law, Periodic relationship among the elements, periodic properties-atomic size, ionization energy, electron affinity, electronegativity

Unit 6: Gaseous State

Pressure of a gas, pressure volume relationship-Boyle's law, the temperature volume relationship-Charle's law, Ideal gas equation, definition of acid and base

Block-III: Hydrocarbon and biomolecule

Unit 7: Hydrocarbons and functional groups

Alkanes, alkenes, alkynes, aromatic hydrocarbons, Preparation and properties of ethene and ethyne. Functional groups in organic compounds-alcohols, ethers, aldehydes, ketones and carboxylic acids.

Unit 8: Carbohydrates and nucleic acid

Carbohydrates: Classification and nomenclature. Monosaccharides, mechanism of osazone formation

Unit 9: Nucleic acid

Introduction, Nitrogen bases, purines, pyrimidines, nucleosides, nucleotides, structure of RNA and DNA molecule

Unit 10: Metal ion in biological syatem

A brief introduction to bio-inorganic chemistry. Role of metal ions present in biological systems with special reference to Na^+, K^+ and Mg^{2+} ions: Na/K pump; Role of Mg^{2+} ions in energy production and chlorophyll.

Block-IV: Redox reactions and catalysis

Unit 11: Oxidation and reduction

Use of redox potential data- analysis of redox cycles, redox stability in water-Frost, Latimer and Pourbaix. Principles involved in the extraction of the element.

Unit 12: Catalysis

Catalysis, characteristics of catalyzed reactions, Classification of catalysis, miscellaneous examples.

SEMESTER-I

MINOR: LABORATORY COURSE/PRACTICAL

Programme:	**Year: I**	**Semester-I**
Course Code: CHE(N)-120L		
Course Name: Laboratory Course/Work		
Credit: 1		
Max. Marks: 50		

Course Objective and Outcomes:

After completing this course, the learners will be able to quantitatively find out the amount of acid or base in the samples, to qualitatively differentiate among different classes of organic compounds and detection of elements. Learnes able to separate and identfy the sugars by chromatographic techniques.

Syllabus Details

Block-1: Laboratory hazards and safety

Unit 1: Laboratory hazards and safety precautions

Block -2: Experiment

Unit 1: Compound identification

1. Detection of extra elements (N, S, Cl, Br, I) in organic compounds
2. Chemical, physical and functional group tests.

Unit 2: Titrationn and chromatography

1. Acid base titration
2. Identify and separate the sugars present in the given mixture by paper chromatography.

Distribution of marks shall be as given below:

1.	Identification of element and functional group	:	12
2.	Titration	:	12
3.	Chromatography exercise	:	11
4.	Viva	:	05
5.	Home assignment/internal assessment,lab record and attendance	:	10