# Shahid Matangini Hazra Govt. General Degree College for Women
# Department of Chemistry
# POs, PSOs and COs

**Programme Outcomes (POs)**

| PO | Description |
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| PO1 | Student acquires basic idea about fundamental laws, kinetics, basic rules and principles of chemistry that involve in different types of physico-chemical phenomena. |
| PO2 | Student gains knowledge about physical and chemical properties, spectral and magnetic properties, optical and geometrical properties, structures and bonding of organic and inorganic compounds also biomolecules. |
| PO3 | Student learns about syntheses, chemical reaction and mechanism, separation techniques of compounds. |
| PO4 | Student acquires knowledge about the basic application, function, use and also adverse effect of different kinds of materials and compounds. |
| PO5 | Student gains basic idea about the analysis and characterization of compounds as well as biological and environmental samples. |
| PO6 | Student becomes aware about the impact of chemistry on the environment, society and also everyday life. |

**Programme Specific Outcomes (PSOs)**

| PSO | Description |
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| PSO1 | Be able to explain properties of matter, thermodynamics and kinetics of physico-chemical phenomena of macro and microscopic systems. |
| PSO2 | Acquiring basic knowledge and understanding to carry out the synthesis, characterization, analysis and separation of compounds. |
| PSO3 | Acquiring knowledge and idea about the different properties, structure and bonding, reaction mechanism application and use of compounds. |

**Courses Outcomes (COs)**

| Paper Name | Course | Outcomes |
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| **SEM-I(CC1)**<br>**Organic Chemistry**<br>a) Bonding and Physical Properties<br>b) General Treatment of Reaction Mechanism I<br>c) Stereochemistry I | CO1 | CO1.1: Basic idea about bonding and Properties of organic molecules<br>CO1.2: Acquire knowledge about the reaction mechanism of organic reaction<br>CO1.3: To understand symmetry and optical activity of chiral compounds. |
| **SEM-I(CC2)**<br>**Physical Chemistry**<br>a) Kinetic Theory and Gaseous state<br>b) Chemical Thermodynamics | CO2 | CO2.1: Acquire knowledge about the behaviour of different ideal gases and real gases.<br>CO2.2: Know about the thermodynamic principles or laws governing the physiochemical behaviour of a system<br>CO2.3: Gain knowledge about the kinetics of a chemical reactions. |

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| c) Chemical kinetics | | |
| **SEM-II(CC3)**<br>**Inorganic Chemistry**<br>a) Extra nuclear Structure of atom<br>b) Chemical periodicity<br>c) Acid-Base reactions<br>d) Redox Reactions and precipitation reactions | CO3 | CO3.1: Know about the fundamentals behavior of sub-atomic particles.<br>CO.3.2: Explain the nature of elements and their different periodic properties.<br>CO3.3: Know about the acid-base nature of different substance.<br>CO3.4: Know about the redox nature of different substance. |
| **SEM-II(CC4)**<br>**Organic Chemistry**<br>a) Stereochemistry II<br>b) General Treatment of Reaction Mechanism II<br>c) Substitution and Elimination Reactions | CO4 | CO4.1: To understand symmetry and optical activity of chiral compounds.<br>CO4.2: Acquire knowledge about the reaction mechanism of organic reaction<br>CO4.3: Idea about Substitution and Elimination Reactions. |
| **SEM-III(CC5)**<br>**Physical Chemistry**<br>a) Transport processes<br>b) Applications of Thermodynamics – I<br>c) Foundation of Quantum Mechanics | CO5 | CO5.1: Know about the principle of transport processes.<br>CO5.2: Gain knowledge about the application of thermodynamic laws or principle to explain physico-chemical changes.<br>CO5.3: Learn about theoretical approach to explain the properties of physico-chemical systems. |
| **SEM-III(CC6)**<br>**Inorganic Chemistry**<br>a) Chemical Bonding-I and II<br>b) Radioactivity | CO6 | CO6.1: Acquire knowledge about the different types of interactions present in molecules and recognize the three dimensional structures of molecules by VBT and MOT.<br>CO6.2: Knowledge about the radioactivity and related phenomena of radioactive atoms. |
| **SEM-III(CC7)**<br>**Organic Chemistry**<br>a) Chemistry of alkenes and alkynes<br>b) Aromatic Substitution<br>c) Carbonyl and Related Compounds<br>d) Organometallics | CO7 | CO7.1: Chemical behaviour of different types of organic molecules including hydrocarbon and carbonyl compounds.<br>CO7.2: Knowledge about electrophilic and nucleophilic aromatic substitution reaction of organic molecules.<br>CO7.3: Know about chemical behaviour of organometallic compounds. |
| **SEM-IV(CC8)**<br>**Physical Chemistry**<br>a) Application of Thermodynamics – II<br>b)Electrical Properties of molecules<br>c) Quantum Chemistry | CO8 | CO5.1: Application of thermodynamic laws or principle to explain physico-chemical changes<br>CO5.2: Study the behaviour of Electrical Properties of molecules<br>CO5.3: Theoretical approach to explain properties of macro and micro systems. |
| **SEM-IV(CC9)**<br>**Inorganic Chemistry**<br>a) General Principles of Metallurgy<br>b) Chemistry of *s* and *p* Block Elements<br>c) Coordination Chemistry-I | CO9 | CO9.1: Know about metal extraction and purification techniques.<br>CO9.2: Reaction, structure and bonding properties of s and p-block elements<br>CO9.3: Basic idea about coordination chemistry. |

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| **SEM-IV(CC10)**<br>**Organic Chemistry**<br>a) Nitrogen compounds<br>b) Rearrangements<br>c) The Logic of Organic Synthesis<br>d) Organic Spectroscopy | CO10 | CO10.1: Acquire knowledge about properties and reaction of nitrogen compounds<br>CO10.2: Know about rearrangement reaction of organic molecules.<br>CO10.3: Get an idea about syntheses of organic molecules.<br>CO10.4: Application of UV, IR, NMR Spectroscopy in different organic compounds. |
| **SEM-V(CC11)**<br>**Inorganic Chemistry**<br>a) Coordination Chemistry-II<br>b) Chemistry of d- and f-block elements | CO11 | CO11.1:.Application and study the properties of coordination compound.<br>CO11.2: Reaction, structure and bonding properties of d and f-block elements |
| **SEM-V(CC12)**<br>**Organic Chemistry**<br>a) Carbocycles and Heterocycles<br>b) Cyclic Stereochemistry<br>c) Pericyclic reactions<br>d) Carbohydrates and Bio-molecules | CO12 | CO12.1: Get an idea about carbocyclic and heterocyclic reactions.<br>CO12.2: To understand symmetry and optical activity of cyclic chiral compounds<br>CO12.3: Knowledge about pericyclic reaction of organic molecules.<br>CO12.4: Identification and analyses of different types of Carbohydrates and Bio-molecules |
| **SEM-VI(CC13)**<br>**Inorganic Chemistry**<br>a) Bioinorganic Chemistry<br>b) Organometallic Chemistry<br>c) Reaction Kinetics and Mechanism | CO13 | CO13.1: Acquire knowledge about enzymatic and catalytic biological processes.<br>CO13.2: Application of organometallic compounds in the fields of catalysis, medicine etc.<br>CO13.3: Acquire knowledge about the reaction mechanism of inorganic molecules. |
| **SEM-VI(CC14)**<br>**Physical Chemistry**<br>a) Molecular Spectroscopy<br>b) Photochemistry<br>c) Surface phenomenon | CO14 | CO14.1: Know about fundamental principles of different spectroscopic techniques.<br>CO14.2: Study the different types of photochemical reactions<br>CO14.3: Basic idea about the laws of surface phenomena of liquids and solids.<br>Process. |
| **SEM-V(DSE1)**<br>**Advanced Physical Chemistry**<br>a) Crystal Structure<br>b) Statistical Thermodynamics<br>c) Specific heat of solid, 3rd law and Adiabatic demagnetization | CO15 | CO15.1: Know about the structural properties of solid.<br>CO15.2: Acquires knowledge about the properties microscopic particles.<br>CO15.3: Gain basic theoretical laws and principles of matter. |
| **SEM-V(DSE2)**<br>**Analytical Methods in Chemistry**<br>a) Qualitative and quantitative aspects of analysis<br>b) Optical , Thermal & Electroanalytical methods of analysis methods of | CO16 | CO16.1: Learn basic concepts of different analytical techniques including optical, thermal and electrical.<br>CO16.2: Know about different techniques of separation including chromatography and solvent extraction. |

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| analysis<br>c) Separation techniques | | |
| **SEM-VI(DSE3)**<br>**Green Chemistry**<br>a) Principles of Green Chemistry and Designing a Chemical synthesis<br>b) Examples of Green Synthesis/ Reactions and some real world cases<br>c) Future Trends in Green Chemistry | CO17 | CO17.1: Know about the principle and designing of green chemistry.<br>CO17.2: Learn about synthesis of the green chemical reaction. |
| **SEM-VI(DSE4)**<br>**Polymer Chemistry**<br>a) Introduction and history of polymeric materials<br>b) Nature and structure and functionality of polymers<br>c) Properties of Polymer | CO18 | CO18.1: Study the properties and characterization of polymers.<br>CO18.2: Know about the syntheses and applications of polymers in different field. |
| **SEM-III(SEC1)**<br>**Analytical Clinical Biochemistry**<br>a) Basic understanding of the structures, properties and functions of carbohydrates, lipids and proteins<br>b) Biochemistry of disease: A diagnostic approach by blood/ urine analysis | CO19 | CO19.1: Acquire knowledge about the properties, structure and function of biomolecules including carbohydrate, proteins, Lipids, enzymes.<br>CO19.2: Know about the diagnosis approach of blood and urine. |
| **SEM-IV(SEC2)**<br>**Pesticide chemistry**<br>a) General introduction to pesticides<br>b) Synthesis, structure and use of Pesticides | CO20 | CO20.1: Get general idea about pesticides and adverse effects (natural and synthetic)<br>CO20.2: Acquiring knowledge about syntheses, structure and uses. |