

**DEPARTMENT OF CHEMISTRY**  
**S.D.Women's College, Rajgangpur**  
**CHEMISTRY (B.Sc)**

**1. PROGRAMME OUTCOMES:-**

**PO1:** Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in analytical, organic, inorganic and physical chemistry`.

**PO2:** Students will understand the importance of the elements in the periodic tables including their physical and chemical nature and role in daily life.

**PO3:** They will understand the concept of chemistry to inter relate and interact to the other subjects like mathematics, physics, biological science etc.

**PO4:** To introduce the students to modern laboratory methods and principles using state of the art scientific equipment's. The students are exposed to applied laboratory techniques, critical thinking, independent and team learning and are provided with research opportunities

**2. PROGRAMME SPECIFIC OUTCOMES:**

**PSO1:** Have sound knowledge about the fundamentals and applications of chemical and scientific theories.

**PSO2:** Develop analytical skills and problem-solving skills requiring application of chemical principles.

**PSO3:** Every branch of science and technology is related to chemistry and so the students will have an access to different branches of science and technology.

**PSO4:** Will become familiar with different branches of chemistry like analytical, physical, organic, inorganic, environmental, polymer and bio-chemistry.

**PSO5:** Apply appropriate techniques for the qualitative and quantitative analysis of chemicals in laboratories and in industries.

**PSO6:** Easily assess the properties of all the elements discovered till yet.

**3: COURSE OUTCOMES:**

**I SEMESTER**

**CORE 1: INORGANIC CHEMISTRY**

C1: To visualize the interior of atoms and molecules and thereby predicting properties of matter.

C2: To explain some important chemical and physical properties of elements.

C3: To understand how the concept of valance can account for, and predicts the formulas of compounds, sketch Lewis structure of molecules and ions.

C4: Determine and learn about dipole moment and bond angel of the inorganic molecule.

## **CORE 2: PHYSICAL CHEMISTRY**

C1: To explain the principles concerning solid state structure. C2: To describe specific crystals structures by applying basic crystallographic concept.

C3: To explain about solid state.

C4: To explain about Ionic equilibria.

## **II SEMESTER**

### **CORE 3: ORGANIC CHEMISTRY**

C1: To understand nucleophile and electrophile groups and their properties.

C2: To learn and apply various concepts such as stereochemistry and fundamental principles of stereoselectivity in organic chemistry.

C3: Associate different bond types of carbon and its hybrid orbitals.

### **CORE 4: PHYSICAL CHEMISTRY**

C1: Explain fundamental thermodynamic properties.

C2: To explain second law and third law of thermodynamics. C3: To define and discuss Le-Chatelier's principle.

C4: Discuss the concept of colligative properties.

## **III SEMESTER**

### **CORE 5: INORGANIC CHEMISTR-II**

C1: To explain general principles of metallurgy.

C2: To describe different types of acid-base reaction.

C3: to discuss the fundamental aspects of main group chemistry. C4: to understand the structure, nomenclature, reactivity and properties of S & P block elements.

### **CORE 6: ORGANIC CHEMISTRY-II**

C1: To explain the method of preparation of necleophiticsubstitution reaction.

C2: To explain the method of preparation and properties of alcohol, phenol, ethers and epoxides.

C3: To describe the structure, reactivity and preparation of carbonyl compound

### **CORE 7: PHYSICAL CHEMISTRY-III**

- C1: To explain the phase diagrams of different systems.
- C2: To understand phase equilibrium, criteria, CST, Gibb's-Dubem-Margules equation.
- C3: To describe rate law and rate of reaction, theories of reaction rate catalysts.
- C4: To explain about catalysts and surface chemistry

### **IV SEMESTER**

### **CORE 8: INORGANIC CHEMISTRY-III**

- C1: understand the terms ligands, VBT, CFT etc.
- C2: To explain the electronic configuration, magnetic and catalytic properties of transition elements.
- C3: To explain the chemistry of Ti, V, Cr, Mn, Fe and CO

### **CORE 9- ORGANIC CHEMISTRY-III**

- C1: To explain the preparation and properties of nitrogen containing functional groups.
- C2: To explain the preparation and the synthetic application of diazonium salts.
- C3: To explain the classification, nomenclature, structure, aromaticity in 5-membered and 6-membered ring containing and hetero atom.

### **CORE 10- PHYSICAL CHEMISTRY-IV**

- C1: To explain the chemistry of conductance and the variation with dilution, migration of ions in solutions.
- C2: To learn the applications of conduction measurements.
- C3: To explain about electrochemistry.
- C4: To explain about electrochemistry and electrical properties of molecules and atoms.

### **V SEMESTER**

### **CORE 11- ORGANIC CHEMISTRY-IV**

- C1: To explain the basic principles of UV spectroscopy.
- C2: To determine functional groups in molecules.
- C3: To explain the application of NMR and mass spectroscopy.
- C4: To describe the occurrence, classification and the biological importance of carbohydrate.

### **CORE 12-PHYSICAL CHEMISTRY –V**

- C1: To explain about quantum chemistry.
- C2: To explain the different types of bonding in chemical compound.
- C3: To explain rotational and

vibrational spectroscopy.

### **DSE 1- POLYMER CHEMISTRY**

C1: To explain the history and functionality and its importance of polymer material.  
C2: To explain the mechanism and kinetics of polymer. C3: To explain the molecular weight and glass transition temperature of polymer.

### **DSE 2- GREEN CHEMISTRY**

C1: To explain the principles of green chemistry.  
C2: To explain the designing a chemical synthesis of green chemistry. C3: To explain the examples and reaction of green chemistry.  
C4: To explain future trends in green chemistry.

## **VI SEMESTER**

### **CORE 13- INORGANIC CHEMISTRY-IV**

C1: To explain organometallic compound.  
C2: To explain different preparation and properties of organometallic compound.  
C3: To explain the catalysis of organometallic compound.  
C4: To explain the thermodynamic and kinetic aspects and reaction mechanism of metal complex.

### **CORE 14- ORGANIC CHEMISTRY-V**

C1: To explain about amino acids, peptides and proteins. C2: To explain about enzymes and nucleic acids.  
C3: To explain about lipids and concept of energy in bio cycles. C4: To explain pharmaceutical compounds, its structure and importance.

### **DSE 3- INDUSTRIAL CHEMICALS AND ENVIRONMENT**

C1: To explain about industrial gases and inorganic chemicals. C2: To explain about environment and its segment.  
C3: To explain about water pollution and industrial waste management.  
C4: To explain energy and environment

### **DSE 4- DISSERTATION/ PROJECT**