



NISTARINI COLLEGE, PURULIA

AFFILIATED TO SIDHO KANHO BIRSHA UNIVERSITY, PURULIA

NAAC Reaccredited "A" Grade (CGPA 3.14)

DEPARTMENT OF CHEMISTRY

Program Outcomes, Program Specific Outcomes and Course Outcomes

Department of Chemistry

Programme Outcomes: B. Sc. Chemistry (Hons.)

Department of Chemistry	After successful completion of three year degree program in Chemistry a student should be able to;
Programme Outcomes	<p>PO-1. Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.</p> <p>PO-2. Solve the problem and also think methodically, independently and draw a logical conclusion.</p> <p>PO-3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.</p> <p>PO-4. Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.</p> <p>PO-5. Find out the green route for chemical reaction for sustainable development.</p> <p>PO-6. To inculcate the scientific temperament in the students and outside the scientific community.</p> <p>PO-7. Use modern techniques, various equipments and Chemical softwares.</p>

Programme Specific Outcomes	<p>PSO-1. Gain the knowledge of Chemistry through theory and practical experiments.</p> <p>PSO-2. To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.</p> <p>PSO-3. Identify chemical formulae and solve numerical problems.</p> <p>PSO-4. To understand the basic principles of Organic, Inorganic, Physical and Analytical Chemistry and its applications through Various laboratory experiments.</p> <p>PSO-5. Use modern chemical tools, Models, Chem-draw, Charts and Equipments.</p> <p>PSO-6. Understand good laboratory practices and safety.</p> <p>PSO-7. Develop research oriented skills.</p> <p>PSO-8. Aware and handle the sophisticated instruments/equipments.</p>
Course Outcomes B. Sc Chemistry Semester- I	
Course	Outcomes After completion of these courses students should be able to:
BCEMCCHC-101 ORGANIC CHEMISTRY	CO-1. Understanding the Valence Bond Theory and MO Theory. CO-2. Understanding of the Stereochemistry of organic molecules. CO-3. Mechanistic approach of different organic reactions and reaction Intermediates.
BCEMCCHC-102 PHYSICAL CHEMISTRY	CO-1. Understand the basic principles of Kinetic Theory of Gases. CO-2. Understand the Macroscopic Thermodynamics at equilibrium, Zeroth Law, 1 st Law of Thermodynamics.

	<p>CO-3. Adiabatic and Isothermal processes.</p> <p>CO-4. Work Done in isothermal and adiabatic processes.</p> <p>CO-5. Specific Heat and Kirchoff's Equation.</p> <p>CO-6. Joule-Thomson's Experiment.</p> <p>CO-7. Basic Principles of Kinetics of a reaction, rate of a equation, Molecularity and order of a reaction, rate determining step.</p>
SEMESTER - II	
BCEMCCHC-201 INORGANIC CHEMISTRY	<p>CO-1. Define organic acids and bases and various theories of acid-bases.</p> <p>CO-2. Gather an in-depth knowledge about atomic structure.</p> <p>CO-3. Understand the periodicity of the elements.</p> <p>CO-4. Understand the concepts of a redox reaction.</p> <p>CO-5. Explain various phenomenon of redox reactions using Nernst Equation.</p>
BCEMCCHC-202 ORGANIC CHEMISTRY	<p>CO-1. Understand the basics of Stereochemistry.</p> <p>CO-2. Understand the reaction mechanisms like SN1, SN2, E1, E2.</p> <p>CO-3. Basic idea reaction Thermodynamics and Kinetics.</p>
SEMESTER - III	
CEMCCHC-301 PHYSICAL CHEMISTRY	<p>CO-1. Understanding of the concepts of viscosity.</p> <p>CO-2. Understanding the principles of electrochemistry.</p> <p>CO-3. Understanding the requirement of 2nd Law of Thermodynamics.</p> <p>CO-4. Understanding the concepts of Free Energy (G & A).</p> <p>CO-5. Spontaneity and directional sense of a process from Thermodynamic point of view.</p> <p>CO-6. Understanding the concepts of Chemical Equilibrium.</p> <p>CO-7. Preliminary idea and foundations of Quantum Mechanics.</p>
BCEMCCHC-302 INORGANIC CHEMISTRY	<p>CO-1. Thorough understanding of Chemical Bonding with special Emphasis on Ionic, Covalent bonding.</p> <p>CO-2. Concepts of weak bonds like Hydrogen Bond, van der Waals bond.</p> <p>CO-3. Understanding the concepts of Molecular Orbital Theory.</p> <p>CO-4. Metallic bonding and concepts of semi-conductors.</p>

BCEMCCHC-303 ORGANIC CHEMISTRY	CO-1. Understanding of the chemistry of unsaturated compounds. CO-2. Aromatic substitution reaction mechanisms. CO-3. Understanding of various reactions of the Carbonyl Group. CO-4. Elementary idea of Green Chemistry. CO-5. Understanding of Organometallic chemistry.
BCEMSEHC-304 (SEC-1) ANALYTICAL CHEMISTRY	CO-1. Understanding of the Fundamentals of Analytical Chemistry. CO-2. To carry out the analysis of a soil sample. CO-3. To carry out the analysis of a water sample. CO-4. To carry out the analysis of various food products. CO-5. Understanding of Chromatography.

SEMESTER - IV

SEMESTER - IV	
CEMCCHC-401 PHYSICAL CHEMISTRY	CO-1. Understanding of applications of the Laws of Thermodynamics. CO-2. Concepts of Ionic Equilibrium. CO-3 Understanding of EMF and Electrochemical Cell. CO-4. Understanding of surface phenomena like surface tension, Adsorption, Colloids. CO-5. Basic principles of Nano Science.
BCEMCCHC-402 INORGANIC CHEMISTRY	CO-1 Understanding of the basic principles of Metallurgy. CO-2. Detailed knowledge of s- and p- block elements. CO-3. Detailed study of the Noble gases. CO-4. Elementary idea of Inorganic polymers. CO-5. Thorough understanding of Co-ordination Chemistry. CO-6. Isomerism of Inorganic Compounds. CO-7. IUPAC nomenclature of Inorganic compounds.
BCEMCCHC-403 ORGANIC CHEMISTRY	CO-1. Detailed study of organic nitrogenous compounds. CO-2. Rearrangement reactions and their mechanism. CO-3. Development of Logic of Organic Synthesis. CO-4. Understanding of asymmetric synthesis. CO-5. Understanding of Organic spectroscopy with special emphasis To UV-Vis, IR, NMR spectroscopy and their applications.
BCEMSEHC-404 (SEC-2) BIO-CHEMISTRY	CO-1. Understanding of the concepts of Carbohydrates, amino acids. CO-2. Understanding the formation of proteins and enzymes. CO-3. Basic principle of the Watson-Creek model of DNA. CO-4. To develop a preliminary idea about Biochemistry of Disease

SEMESTER - V	
BCEMCCHC-501 INORGANIC CHEMISTRY	CO-1. Thorough understanding of Co-ordination chemistry in the light Of VBT, CFT, LFT. CO-2. Understanding of the colour and spectra of co-ordination Compounds and their magnetic properties. CO-3. Detailed study of d- and f- transition elements. CO-4. Detailed study of Lanthanides and Actinides.
BCEMCCHC-502 ORGANIC CHEMISTRY	CO-1. Detailed study of Carbocycles and Heterocycles. CO-2. Understanding of the stereochemistry of cyclic compounds. CO-3. Understanding of Pericyclic reactions. CO-4. Thorough study of Carbohydrates. CO-5. Study of amino acids, peptides and nucleic acids.
BCEMDSHC-503 (DSE-1) ADVANCED PHYSICAL CHEMISTRY	CO-1. Detailed study of crystal structure. CO-2. Understanding the concepts of Statistical Thermodynamics. CO-3. Understanding of the 3 rd Law of Thermodynamics. CO-4. Deeper insight of Quantum Mechanics.
BCEMDSHC-504 (DSE-2) INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE	CO-1. Understanding of preparation of glass, ceramics and silicates. CO-2. Elementary idea of Fertilizers. CO-3. A study of batteries. CO-4. Elementary idea of alloys. CO-5. Developing the idea and concepts of catalysis. CO-6. Developing the idea of preparation of chemical explosives.

SEMESTER - VI	
BCEMCCHC-601 INORGANIC CHEMISTRY	CO-1. Developing the idea and concepts of Bio-inorganic chemistry. CO-2. Understanding of Organometallic chemistry from Inorganic Point of view. CO-3. Study of catalysis by organometallic compounds. CO-4. Understanding inorganic reaction mechanism and kinetics.
BCEMCCHC-602 PHYSICAL CHEMISTRY	CO-1. Understanding of molecular spectroscopy using Born-Oppenheimer approximation. CO-2. Developing the concepts of Photochemistry. CO-3. Various kinds of resonance spectroscopy like NMR, ESR. CO-4. Understanding of Catalysis with a deeper insight.
BCEMDSHC-603 (DSE-3) ANALYTICAL METHODS IN CHEMISTRY	CO-1. Understanding and application of Lambert-Beer's Law. CO-2. Understanding the basic principles of UV-Vis & IR spectroscopy. CO-3. Understanding of thermal methods like TG, DSC. CO-4. Understanding of Electroanalytical methods like conductometry, potentiometry. CO-5. Understanding of separation techniques like GC, HPLC, TLC.
BCEMDSHC-604 (DSE-4) GREEN CHEMISTRY	CO-1. Understanding of the concepts of Green Chemistry. CO-2. Understanding the basic principles of Green Synthesis. CO-3. Requirements of Green Chemistry. CO-4. Understanding the Future Trends of Green Chemistry.