Department of Chemistry, J. K. College, Purulia

Name of the course	Course objectives	Course Specific objectives
BSc (H) Part 1	To encourage and enable students to develop interest and curiosity about basic concepts of Inorganic, Organic and Physical chemistry.	The aim of this course is to provide an introduction to fundamental chemical principles concerning the atomic and molecular structures and geometries. The students will understand different Acid-Base and redox reactions, various kinds of coordination bonds including stereoisomerism and the aggregation states of matter. The students will be able to analyze and evaluate various thermodynamic cycles used for energy production within the natural limits of conversion. Moreover students will gain knowledge of the fundamental concepts of stoichiometry. They will acquire the skills necessary to analyze organic compounds qualitatively in a chemical laboratory.
BSc(Gen) Part 1	To make them recall the fundamental principles of organic chemistry as well as atomic structure and properties of elements.	In this course students will gain an understanding of chemical bonding, nomenclature, elementary stereochemistry, reactivity and stability of organic compounds. Upon successful completion students will understand chemical equilibrium, acid-base reactions, buffers including vast applications. They will be able to detect functions groups in simple organic molecules qualitatively.
BSc(H) Part 2	To provide knowledge about group chemistry, radioactivity, organic reaction mechanisms and fundamental properties of atoms, molecules and different states of matter such that they can critically interpret the primary chemical literature.	The main objective is to develop foundation knowledge of reactivity of main group elements. By the end of this course students will recognize and interpret various radioactive interactions and their applications. Teachers will guide students to demonstrate dynamic and applied comprehension of many organic reactions. Students will be able to perform a systematic qualitative analysis of mixtures of inorganic compounds in semimicro methods with a broad understanding of scientific concepts.
BSc(Gen)	To provide a firm foundation in reactivity of group elements and fundamental concepts of physical chemistry.	A brief comparative study of the group elements in the periodic table on the basis of electronic distribution, positions etc. will make them familiar with applications of theoretical of inorganic

Part 2		chemistry. The aim of this course is to provide a package of key mathematical concepts and skills required to succeed in physical chemistry. Students will be able to analyse a mixture of inorganic compounds in a chemical laboratory.
BSc(H) Part 3	To motivate students in learning import roles of coordinate compounds and transition elements, different instrumental methods used to separate, identify and quantify matter. To introduce current ideas on biomolecules and spectroscopy. To incorporate students with fundamental non relativistic quantum mechanics.	In this course students will be aware of the vital role of coordination compounds in metallurgy and medicine. By the end of this course students will apply their experience to solve many equations and calculate observables of individual wave functions. In this course they will be able to use their quantitative reasoning skills to determine quantities of matter and evaluate data generated by experimental methods. In laboratory techniques students will be interested in research and development of material science. The studies on biochemistry will help students to understand the functioning of various body processes in living organisms. Students will learn to design, safely conduct and interpret chemical research.
BSc(Gen) Part 3	To inform them about the role of analytical chemistry, proteins and polymers in science and technologies.	In this course students will be able to evaluate analytical data in terms of statistics and the effects of systematic errors on analytical results. The description of structures and properties of selected biomolecules and polymers will make them interested in structural biology as well as in plastic technology. Quantitative analyses of some solutions of metal compounds will enhance their laboratory skills.

Course name	**Course objectives**	**Course specific objectives**
Sem 1- BCEMCCHC101* BCEMCCHC102 Honours + Program course(BCEMCCRC101)* *Same syllabus	To provide an introduction to basic concepts and skills in physical chemistry. To inspire students exploring structures and properties of organic compounds. To train students safe working practices in a chemical laboratory.	In this course students will acquire key concepts on basic reaction mechanisms of selected aliphatic and aromatic molecules with special emphasis on stereochemistry. Instructions will be provided regarding practical skills, health awareness and presentation of practical report properly. Students will understand the science of

		relationship among heat, work and chemical reactions.
Sem 2- BCEMCCHC201* BCEMCCHC202 Honours + Program course(BCEMCCRC201)* *Same syllabus	To enable the students to be interested in basic concepts and exciting aspects of inorganic chemistry. To develop ability to be inquisitive towards advanced organic chemistry. To engage students in developing skills to understand the process of scientific investigation.	After successful completion of this course students will get an overview of atomic structure and chemical periodicity. The study of the detailed processes of reaction mechanisms will help them in understanding and predicting favored pathways of various untried reactions. Illustrative experiments to support the materials taught and to adopt modern techniques used in the synthesis and quantitative estimation will increase their scientific reasoning ability.
Sem 3-BCEMCCHC301* BCEMCCHC302 BCEMCCHC303 BCEMSEHT305* Honours + Program course(BCEMCCRC301* BCEMSERT304*) *same syllabus	To provide students proficiency in characterization of inorganic and organic compounds and of the role of energy in determining the structure and reactivity of molecules. To make them able to plan and execute quantitative measurements including the use of chemical literature.	This course will provide the essential tools required to study applications of thermodynamic systems. Students will learn to describe the behavior of matter and energy in the subatomic scale using mathematical calculations. By the end of this course students will identify and demonstrate different types of chemical bonds. Students will be aware about benefits and disadvantages of radioactivity. They will get an authentic and engaging experience of ionizing radiations. Students will understand the reactivity of multiple bond and carbonyl compounds as well as organometallics useful for the synthesis of many complex molecules. The skill enhancement course will provide students information about development, application and study of various analytical procedures for a wide variety of contaminations.
Sem 4-BCEMCCHC401 BCEMCCHC402 BCEMCCHC403 BCEMSEHT405* Honours + Program course(BCEMCCRC401	To provide the concept of phase equilibria and application of thermodynamics in electrochemical systems. To introduce preliminary concepts on nanochemistry and its benefits. To emphasize on structural and electronic and chemical properties of s and p block elements and their applications. To	By the end of this course students will be able to explain principle of retrosynthetic analyses and its application with review of new techniques. After completing the course, students will be able to identify and interpret the biochemistry and analytical chemistry that can be applied to

BCEMSERT404*) *same syllabus	make students capable of understanding analytical clinical biochemistry.	medical diagnosis. Students will be enriched with concepts of surface chemistry which can be helpful for future research in the fields of heterogeneous catalysis, electrochemistry and geochemistry. Students will gain ideas on basic principles of metallurgy that will make them interested in techniques including various types of chemical processing.
Sem 5-BCEMCCHC501 BCEMCCHC502 BCEMDSHC503 BCEMDSHC504* Honours + Program course(BCEMDSRC501*) *Same syllabus	To provide a vast description of different chemical processes of industrial importance. To give a basic idea of computational chemistry. To give a comprehensive understanding of VB and MO concept in coordination chemistry. To describe application of quantum mechanics to fundamental problems of chemistry. To teach students about major functions of carbohydrates and biomolecules.	Knowledge about chemical industries which has touched all our facets of life like Agriculture, Environment, Food, hygiene etc will be very much helpful for students to select right things for usage. They will be trained about techniques involving Gravimetry, Spectrophotometry and Chromatography for separating and analyzing various complex mixtures. Students will be able to demonstrate the need of quantum chemistry to describe the world around us. Analysis of electronic structures of molecules using molecular visualization software will make them interested in contemporary field of theoretical research. Recognition of structures and functions of many biomolecules and complex sugars will be very much helpful for application of protein and carbohydrate chemistry to biotechnology.
Sem 6- BCEMCCHC601 BCEMCCHC602 BCEMDSHC603* BCEMDSHC604 Honours + Program course BCEMDSRC601* *Same syllabus	To explain different analytical methods in chemistry including spectrometry. To supply the very best comprehensive resource of Molecular spectroscopy and Photochemistry. To aware the students about the need to shift chemistry towards a more sustainable direction—one that maintains the integrity of the environment. To make students capable of analyzing inorganic compounds qualitatively by semimicro methods. To	During this course students will be concerned about the field of bioinorganic chemistry which has grown significantly in recent years and lies at a natural junction between chemistry, biology and medicine. The course offers an effective means for presenting descriptive inorganic chemistry in the laboratory and illustrates important chemical principles, especially those involving ionic

	demonstrate the ability to design, improve and operate various kinds of separation techniques in analytical chemistry.	equilibria. After completion of this course the students will be able to analyze and interpret resonance spectra that are widely used in modern research to infer structures and properties of complex molecules. The principles and case studies of green chemistry (to prevent the negative impacts of chemistry on the environment) will guide their interdisciplinary investigations and demonstrate how the principles are integrated into everyday processes.