

Department of Chemistry, City College, Kolkata

(1+1+1)

Program Outcomes

PO 1: Students will be capable of demonstrating comprehensive knowledge and understanding both theoretical and practical in all disciplines of Chemistry.

PO 2: Students can solve their subjective problems very methodically, independently and finally draw a logical conclusion.

PO3: Students can develop critical thinking and to design, carry out, record and analyze the results of chemical reactions.

PO 4: Students will able to get good laboratory practice with proper safety.

PO 5: Students can find out the green route for chemical reaction for sustainable development.

PO 6: Students will be capable of applying modern technologies, handling advanced instruments and Chemistry related soft-wares for chemical analysis, characterization of materials and in separation technology.

PO 7: Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

PO 8: To prepare the students for a successful career in industry and to motivate them for higher education and take up research as a career.

PO 9: To develop an opportunity to work in interdisciplinary groups.

Course Outcome

Name of the Programme	Year of Introduction	Course Code	Course Name	Course Outcome
B.Sc. Chemistry (Hons)	2010	Paper IA (50 M): CHT (12a+12b)	Organic Chemistry (Part-I)	<ul style="list-style-type: none">To provide students with detailed understanding in fundamentals of acyclic stereochemistry, configuration & conformation.To acquaint them with the basic concepts of bonding & physical properties.To introduce them to general treatment of reaction mechanisms including intermediates, thermodynamics & kinetics, acids-bases.To provide them with the details of nucleophilic substitution reactions at sp³ and sp²-carbon centres & its application.

		Paper IB (50 M): CHT (13a+13b)	Physical Chemistry (Part-I)	<ul style="list-style-type: none"> Kinetic theory and Gasous State enrich the students about the molecular behavior and ideal & real properties of gases. Thermodynamics is the back bone of Science. It helps students to feel, realize and understand Chemistry properly. Chemical Kinetics benefit the students in multidirectional ways. Such as the ideas of order, mechanism & dependence of rate constants on temperature of different chemical reactions.
		Paper IIA (50 M): CHT (11a+11b)	Inorganic Chemistry (Part-I)	It introduces the basic concept of atomic structure and radioactivity, periodic table, as well as, it introduces students to the basic concepts of ionic and covalent bonding along with the concepts of acids and bases.
		Paper IIB (50 M): CHP (14a+14b)	Inorganic Chemistry Practical (Part-I)	It trains students in qualitative analysis of inorganic samples by the systematic approach which includes dry test, wet test and confirmatory tests.
		Paper IIIA (50 M): CHT (22a+22b)	Organic Chemistry (Part-II)	<ul style="list-style-type: none"> To acquaint students with the chemistry of electrophilic addition to C=C, nucleophilic addition to C=O and basic concepts of Pericyclic reaction with reference to Diels-Alder reaction.

				<ul style="list-style-type: none"> To provide them with the mechanistic details & stereochemistry of elimination reaction, electrophilic and nucleophilic aromatic substitution. To introduce the chemistry of nitrogen containing organic compounds, organometallics and their synthetic applications. To enable students with the knowledge of rearrangement reactions to electron deficient carbon, nitrogen, oxygen and also various aromatic rearrangements.
				<ul style="list-style-type: none"> Thermodynamics and Equilibrium encourage students to learn and understand more about open system.

		Paper IIIB (50 M): CHT (23a+23b)	Physical Chemistry (Part-II)	<ul style="list-style-type: none"> Quantum Chemistry, imparts students ideas about the origin and preliminaries modern outlook of Chemistry. Liquid state and Viscosity of Fluids enrich students regarding various physical properties of matters and their determinations. Electrochemistry benefits the students in multidirectional ways. Such as the ideas of conductance, electrochemical cell and ionic equilibrium and their determination.
		Paper IVA (50 M): CHT (21a+21b)	Inorganic Chemistry (Part-II)	This paper introduces the general trend in physical and chemical properties of s- and p-block elements in details. Few important compounds of group 13, 14, 15, 16, 17 and 18 are taught in details. The concept of covalent compound is taught at an advanced level. In this part basic introduction of coordination compounds are also given. Redox chemistry is introduced in this paper.
		Paper IVB (50 M): CHP (24a+24b)	Inorganic Chemistry Practical (Part-II) Physical Chemistry Practical (Part-II)	It teaches the quantitative approach of inorganic sample analysis using titrimetric methods. These Physical Chemistry Practical give students preliminary ideas about how experiments and calculations are performed scientifically. It Provides adequate knowledge of handling various sophisticated instruments also.
		Paper V (100 M): CHT (31a+31b+ 31c+31d)	Inorganic Chemistry (Part-II I)	This paper includes detailed study of structure and bonding, magnetism and colour as well as reactivity and stability of coordination compounds. It also includes the general group trend of d - and f-block elements. This paper helps students to learn the basic concepts of organometallic and bio-inorganic
				chemistry as well. Paper V also elaborately introduces the concepts of analytical chemistry as electrochemical, spectral, gravimetric and titrimetric analysis of samples. Analytical methods of separation and statistical methods of chemical analytics are also taught here along with thermodynamic factors controlling dissolution of different chemicals.

<p>Paper VIA (75 M): CHT (32a+32b+ 32c)</p>	<p>Organic Chemistry (Part- III)</p>	<ul style="list-style-type: none"> • To provide students with the knowledge of carbanion chemistry and its wide applications in synthetic organic chemistry, especially the conception of C-C bond formation and breaking. • To develop the concept of cyclic stereochemistry and the chemistry of cyclohexanes. • To teach them the principles and applications of UV, IR and NMR (proton only) spectroscopy to complete the foundation in organic chemistry. • To enable students with in-depth knowledge of retrosynthesis, protecting groups, strategy of ring synthesis & asymmetric synthesis, so that they understand designing of synthetic routes and its viability. • To develop concepts in the diverse chemistry of heterocyclic compounds, polynuclear hydrocarbons and biomolecules like carbohydrates & proteins and to study their reactions.
<p>Paper VIIA (75 M): CHT (33a+33b+ 33c)</p>	<p>Physical Chemistry (Part- III)</p>	<ul style="list-style-type: none"> • Properties of solids, interfaces, and dielectrics enrich the students about the physical aspects. • Quantum Chemistry, Statistical Thermodynamics and Spectroscopy impart students ideas about Modern Chemistry. • Phase Equilibria and Colligative Properties provide students ideas of Industrial & Metallurgical aspects and electro dialysis, reverse osmosis, electrophoresis, etc. • Kinetics and Photochemistry benefit the students in multidirectional ways. Such as the ideas of order, mechanism & dependence of rate constants on temperature of different chemical reactions and also enormous number of natural & artificial chemical reactions take place photochemically.
<p>Paper VIIIA (50 M): CHP 34b</p>	<p>Organic Chemistry Practical (Part-III): Long experiment</p>	<ul style="list-style-type: none"> • Qualitative analysis of single solid organic compounds by systematic detection of special elements, solubility and functional group enable students with the knowledge of

			<p>fundamental organic reactions.</p> <ul style="list-style-type: none"> Organic preparation, purification, melting point determination and yield calculation of various compounds by different methodology enhance the skill of the students in organic chemistry laboratory.
		<p>Paper VIIB (50 M): CHP 35b</p>	<p>Physical Chemistry Practical (Part-III) Long experiment</p> <p>To provide students with the experimental knowledge of Spectrophotometry, Polarimetry, pH-metry, Conductometry, Potentiometry, etc., It Provides adequate knowledge of handling these sophisticated instruments.</p>
		<p>Paper VIB (25 M) + Paper VIIB (25 M): CHP (34a+35a)</p>	<p>Organic Chemistry Practical (Part-III): Short experiment</p> <p>Physical Chemistry Practical (Part-III): Short experiment</p> <p>34a: Organic Chemistry</p> <ul style="list-style-type: none"> IR and NMR (proton) Spectroscopic analysis of organic compounds acquaint students with the idea of identification of an unknown organic molecule by predicting its structure. <p>35a: Physical Chemistry</p> <ul style="list-style-type: none"> These Physical Chemistry Practical help students how experiments are performed in a short period of time with greater accuracy.

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HOD Chemistry

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