DINABANDHU ANDREWS COLLEGE

AFFLIATED TO UNIVERSITY OF CALCUTTA

Department of Chemistry

UNDERGRADUATE SECTION

Model Reference: University of Calcutta, Syllabus for Chemistry Advanced (CBCS)

[with effect from July 2018 (2018-19)] (Notification No. CSR/12/18)

The Programme Outcomes (PO) of B.Sc. Honours Chemistry Curriculum:

Programme Outcomes Nos	Programme Outcomes (PO)
PO A	To prepare the students to motivate them for higher education, to take up research as a career and a successful career in industry.
PO B	To provide strong foundation in basic sciences and mathematics.
PO C	To identify, formulate and analyze complex scientific problems.
PO D	To develop individual and teamwork by functioning effectively as an individual or as a member in a group in laboratory classes.
PO E	Introduction to advanced instrumentation using modern experimental techniques, ability to independently execute experiments in specially designed chemical glassware as well as handling sophisticated digital instruments.
PO F	To learn documentation and record keeping of laboratory notebooks in a logical and meticulous manner, develop communication skills such as being able to understand and write well, prepare effective presentations, and give and receive clear instructions.
PO G	To develop an opportunity to work in interdisciplinary groups.
PO H	To inculcate scientific temperament in young minds and outside the scientific community.

Programme Specific Outcomes Nos	Programme Specific Outcomes (PSO)
PSO 1	Apply knowledge in emerging and varied areas of Chemistry for higher studies, research and industry and to be acquainted with state-of the art techniques & technologies.
PSO 2	To develop leadership and managerial skills promoting the need for lifelong learning as required for a competent professional.
PSO 3	To develop a neat experimental hand in conformity with good laboratory practices including safety measures.

Mapping of PO & PSO for Chemistry Honours Syllabus of University of Calcutta

Programme Specific Outcomes (PSO) Nos.	PROGRAM OUTCOMES (PO)							
	A	B	C	D	E	F	G	H
PSO 1	√	√	√			√	√	√
PSO 2	√	√	√			√	√	√
PSO 3	√	√	√	√	√	√	√	√

TABLE I (SEMESTER-1)

Paper	COURSE DURATION	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
	Semester 1 6 Months									
			A	B	C	D	E	F	G	H
INORGANIC CHEMISTRY - 1	CEMA – CC - 1-1(TH)	1) Extra nuclear Structure of atom	√	√	√				√	√
		2) Acid-Base reactions	√	√	√				√	√
		3) Redox reactions	√	√	√				√	√
	CEMA – CC - 1-1(P)	1)Acid and Base Titrations: (DEMO ONLY) 2)Oxidation-Reduction Titrations	√	√	√	√	√	√	√	√

Paper	COURSE DURATION Semester-I 6 Months	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
			A	B	C	D	E	F	G	H
ORGANIC CHEMISTRY-1A	CEMA – CC - 1-1(TH)	Bonding & Physical Properties	√	√	√				√	
		General Treatment of Reaction Mechanism I	√	√	√				√	
	CEMA – CC - 1-1(P)	Separation of Components of a binary solid mixture	√	√	√	√		√		
ORGANIC CHEMISTRY - 1B	CEMA – CC - 1-2(TH)	Stereochemistry I	√	√	√				√	
		General Treatment of Reaction Mechanism II	√	√	√				√	
	CEMA – CC - 1-2(P)	Determination of Boiling Points				√		√		
PHYSICAL CHEMISTRY - 1	CEMA – CC - 1-2(TH)	Kinetic Theory & Gaseous State		√	√				√	√
		Transport Processes		√					√	√
		Chemical Kinetics	√	√			√	√		
	CEMA – CC - 1-2(P)	Physical Chemistry Practical		√		√	√	√	√	√

TABLE II

Semester- II (Six months)--------- NO CORE COURSE IN PHYSICAL CHEMISTRY

Paper	COURSE DURATION Semester-II 6 Months	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
			A	B	C	D	E	F	G	H
ORGANIC CHEMISTRY - 2	CEMA – CC - 2-3(TH)	Sterochemistry II	√	√	√				√	
		General Treatment of Reaction Mechanism III	√	√	√				√	
		Substitution and Elimination Reactions		√	√				√	
	CEMA – CC - 2-3(P)	Organic Preparations	√			√	√	√		
INORGANIC CHEMISTRY - 2	CEMA – CC - 2-4(TH)	Chemical Bonding-I	√	√	√				√	√
		Chemical Bonding-II	√	√	√				√	√
		Radioactivity	√	√	√				√	√
	CEMA – CC - 2-4(P)	1. Iodo- / Iodimetric Titrations 2. Estimation of metal content in some selective samples	√	√	√	√	√	√	√	√

TABLE III (SEMESTER-3)

Paper	COURSE DURATION Semester-III 6 Months	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
			A	B	C	D	E	F	G	H
PHYSICAL CHEMISTRY - 2	CEMA – CC - 3-5(TH)	Chemical thermodynamics-1	√	√	√				√	√
		Chemical thermodynamics-1I	√	√	√				√	√
		Systems of Variable Composition		√	√			√		√
		Electrochemistry					√		√	√
	CEMA – CC - 3-5(P)	Physical Chemistry Practical		√	√	√	√	√	√	√
INORGANIC CHEMISTRY - 3	CEMA – CC - 3-6(TH)	Chemical periodicity				√	√			
		Chemistry of *s* and *p* Block Elements				√				
		Noble Gases			√	√				
		Inorganic Polymers			√	√				
		Coordination Chemistry-I			√	√	√			
	CEMA – CC - 3-6(P)	1) Complexometric titration 2) Chromatography of metal ions 3) Gravimetry	√	√	√	√	√	√	√	√
ORGANIC CHEMISTRY - 3	CEMA – CC - 3-7(TH)	Chemistry of Alkenes and Alkynes		√	√				√	√
		Aromatic Substitution		√				√		
		Carbonyl and Related Compounds	√	√		√				
		Organometallics					√	√	√	
	CEMA – CC - 3-7(P)	A. Identification of a Pure Organic Compound (Solid and Liquid) B. Quantitative Estimations					√	√	√	

Paper	COURSE DURATION Semester-III 6 Months	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
			A	B	C	D	E	F	G	H
	SEC 1	Mathematics and Statistics for Chemists	√	√	√		√		√	√

SEC - A	**SEC 2**	Analytical Clinical Biochemistry	√	√	√				√	√

TABLE IV (SEMESTER-4)

Paper	COURSE DURATION Semester-IV 6 Months	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
			A	B	C	D	E	F	G	H
ORGANIC CHEMISTRY - 4	**CEMA – CC - 4-8(TH)**	Nitrogen compounds	√	√					√	
		Rearrangements	√	√	√				√	
		The Logic of Organic Synthesis	√	√	√				√	
		Organic Spectroscopy	√	√	√		√		√	√
	CEMA – CC - 4-8(P)	Qualitative Analysis of Single Solid Organic Compounds		√		√		√		
PHYSICAL CHEMISTRY - 3	**CEMA – CC - 4-9(TH)**	Application of Thermodynamics-II		√	√		√		√	√
		Foundation of Quantum Mechanics	√	√	√				√	√
		Crystal Structure	√		√				√	
	CEMA – CC - 4-9(P)	Physical Chemistry Practical		√	√	√	√	√	√	√
INORGANIC CHEMISTRY - 4	**CEMA – CC - 4-10(TH)**	Coordination Chemistry - II	√	√	√				√	√
		Chemistry of d- and f- Block Elements	√	√					√	√
		Reaction Kinetics and Mechanism	√	√	√				√	√
	CEMA – CC - 4-10(P)	Inorganic Preparations	√	√		√	√	√	√	√

Paper	COURSE DURATION Semester-IV 6 Months	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
			A	B	C	D	E	F	G	H
SEC - B	**SEC 3**	Pharmaceuticals chemistry	√	√	√				√	√
	SEC 4	Pesticide chemistry	√	√	√				√	√

TABLE V (SEMESTER-5)

Semester- 5 (Six months)---------NO CORE COURSE IN INORGANIC CHEMISTRY

Paper	COURSE DURATION Semester-V 6 Months	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
			A	B	C	D	E	F	G	H
PHYSICAL CHEMISTRY - 4	CEMA – CC - 5-11(TH)	Quantum Chemistry II	√	√	√				√	√
		Statistical thermodynamics	√	√	√				√	√
		Numerical Analysis		√	√			√	√	√
	CEMA – CC - 5-11(P)	Computer programs based on numerical methods		√	√	√	√	√	√	√
ORGANIC CHEMISTRY - 5	CEMA – CC - 5-12(TH)	Carbocycles and Heterocycles	√	√	√				√	
		Cyclic Stereochemistry	√	√	√					
		Pericyclic Reactions	√	√	√				√	
		Carbohydrates		√	√				√	√
		Biomolecules	√	√	√				√	√
	CEMA – CC - 5-12(P)	Chromatographic Separations	√		√	√	√	√	√	
		Spectroscopic Analysis of Organic Compounds	√	√	√	√	√	√	√	√

Paper	COURSE DURATION Semester-V 6 Months	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
			A	B	C	D	E	F	G	H
DSE - A	DSE A-2	Applications of Computers in Chemistry	√	√	√			√	√	√
	PRACTICALS - DSE A-2	Applications of Computers in Chemistry	√	√	√	√		√	√	
DSE - B	DSE B-1	Inorganic Materials of Industrial importance	√	√	√				√	√
	PRACTICALS - DSE B-1	Inorganic Materials of Industrial importance	√	√		√	√	√	√	√

TABLE VI (SEMESTER-6)

Semester- 6 (Six months)---------NO CORE COURSE IN ORGANIC CHEMISTRY

Paper	COURSE DURATION Semester-VI 6 Months	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
			A	B	C	D	E	F	G	H
INORGANIC CHEMISTRY - 5	CEMA – CC - 6-13(TH)	Theoretical Principles in Qualitative Analysis	√	√				√	√	√
		Bioinorganic Chemistry	√	√	√				√	√
		Organometallic Chemistry	√	√	√				√	√
		Catalysis by Organometallic Compounds	√	√	√				√	√
	CEMA – CC - 6-13(P)	Qualitative semimicro analysis of mixtures containing not more than three radicals. Emphasis should be given to the understanding of the chemistry of different reactions.	√	√		√	√	√	√	√
PHYSICAL CHEMISTRY - 5	CEMA – CC - 6-14(TH)	Molecular Spectroscopy	√		√		√		√	√
		Photochemistry & Theory of Reaction rate		√	√					√
		Surface Phenomenon		√	√				√	
	CEMA – CC - 6-14(P)	Physical Chemistry Practical		√	√	√	√	√	√	√

Paper	COURSE DURATION Semester-VI 6 Months	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
			A	B	C	D	E	F	G	H
DSE - A	DSE A-3	Green chemistry and chemistry of Natural Products	√	√	√				√	√
	PRACTICALS - DSE A-3	Green chemistry and chemistry of Natural Products	√	√	√	√		√	√	
DSE - B	DSE B-4	DISSERTATION	√	√	√	√	√	√	√	√