

St. Xavier's College,

Ranchi

***(An Autonomous College of Ranchi
University)***

Syllabi

Department of Chemistry

B.SC. (CHEMISTRY HONOURS)

This three-year programme leads to the award of the degree of Bachelor of Chemistry Honours. (B.Sc.). The structure of this Programme is as given in the following table.

SEMESTER I	GROUP A (PHYSICAL)	Paper I
	Gaseous states	
	Chemical Kinetics and Catalysis	
	Liquid State	Paper II
	Thermodynamics	
	GROUP B (INORGANIC)	
	Atomic Structure	
	Periodic Properties	
	Chemical Bonding	
	Structural Aspects of Solids	Paper II
	Analytical Chemistry	
	Structure & Bonding	
	Mechanism of organic reactions	Paper II
	Stereo Chemistry of Organic Compounds	
	Alkanes and Cycloalkanes	
LABORATORY COURSE (INORGANIC)	Paper III	
Acid Radicals		
SEMESTER II	GROUP – A (PHYSICAL)	Paper IV
	Chemical Kinetics and Catalysis	
	Colloidal State	
	GROUP B (INORGANIC)	
	s-Block Elements	
	p-Block Elements	
	Chemistry of Noble Gases	
	GROUP A (PHYSICAL)	
	Thermodynamics II	
	GROUP B (ORGANIC)	
	Alkenes, cycloalkenes, Dienes and Alkynes	Paper V
	GROUP A (PHYSICAL)	
	Thermodynamics H	
	GROUP B (ORGANIC)	Paper VI
	Alkenes, cycloalkenes, dieness and Alkynes	
	Alkyland Aryl Halides	
	(Organic)	Paper VI
	(Physical)	
SEMESTER III	Group – A (Physical Chemistry)	Paper VII
	Phase Equilibrium	
	GROUP – B (INORGANIC)	
	Chemistry of Elements of First Transition Series	
	Coordination Compounds	
	Theories of bonding in complexes	
	Inomerism in complexes	
	GROUP A – (PHYSICAL CHEMISTRY)	

SEMESTER III	Physical Properties & Molecular structure	Paper VIII
	Photochemistry	
	GROUP B (ORGANIC CHEMISTRY)	
	Aldehydes and Ketones	
	Alcohols	
	Phenols	
	Ether and Epoxides	
	LABORATORY COURSE (PHYSICAL)	
Viscosity and surface tension		
(INORGANIC)		
SEMESTER IV	GROUP A (PHYSICAL CHEMISTRY)	Paper X
	Chemical Equilibrium	
	Electrochemistry – I	
	GROUP B (INORGANIC CHEMISTRY)	
	Chemistry of lanthanide Elements	
	Chemistry of Actinides	
	Nuclear Chemistry	
	Non-aqueous Solvents	
	GROUP A (PHYSICAL CHEMISTRY)	Paper XI
	Photochemistry	
	Electrochemistry – II	
	GROUP B (ORGANIC)	
	Carboxylic Acids	
	Carboxylic Acid Derivatives	
	Organic compounds of Nitrogen	
	Electromagnetic Spectrum: Absorption Spectra	
LABORATORY COURSE (ORGANIC)	Paper XII	
SEMESTER V	(INORGANIC CHEMISTRY)	Paper XIII
Hard and Soft Acids' and Bases (HSAB)		
Metal-ligand Bonding in Transition Metal Complexes		
Magnetic properties of Transition Metal Complexes		
Silicones and Phosphazenes		
	(ORGANIC CHEMISTRY)	Paper XIV
	Organic Synthesis via Enolates	
	Carbohydrates	
	Organic metallic Compounds	
	Organic sulphur Compounds	
	Fat, Oils and Detergents	
	(PHYSICAL CHEMISTRY)	Paper XV
	Spectroscopy	
	Rotational Spectrum	
	Vibrational Spectrum	
	Photochemistry	
	Physical Properties and Molecular Structure	
	LABORATORY COURSE (INORGANIC)	Paper XVI
	Synthesis Analysis	
	(ORGANIC)	
	Column. Chromatography	
(PHYSICAL)		
Mole. Et. Determination		

	PROJECT + SEMINAR	
SEMESTER VI	(INORGANIC CHEMISTRY)	Paper XVII
	Electronic Spectra of Transition Metal Complexes	
	Thermodynamic and Kinetic Aspects of Metal Complexes	
	Organometallic Chemistry	
	Bioinorganic Chemistry	
	(ORGANIC CHEMISTRY)	
	Synthetic Polymers	
	Heterocyclic Compounds	
	Synthetic Dyes	Paper XIX
	(PHYSICAL CHEMISTRY)	
	Electronic Spectrum	
	Solutions, Dilute Solutions and Colligative properties	
	Elementary Quantum Mechanics	Paper XX
	LABORATORY COURSE	
	Synthesis of organic compounds	
	(PHYSICAL)	
Electrochemistry		
PROJECT + SEMINAR		

CHEMISTRY SUBSIDIARY - GROUP A (PHYSICAL)

SEMESTER I	Thermochemistry	
	Thermodynamics	
	Gaseous States	
	Group B (Inorganic)	
	Atomic Structure	
	Group C (Organic)	
	Aldehydes & Ketones	
	P R A C T I C A L	
	Volumetric Analysis	
SEMESTER II	Group A (Inorganic)	
	General Chemistry Of Group IB, IIA, IIB Elements	
	Group B (Organic)	
	Group C (Physical)	
	Chemical Equilibrium	
	Dilute solution	
P R A C T I C A L		
SEMESTER III	GROUP A (INORGANIC CHEMISTRY)	
	Ionic Bond	
	Covalent bonds	
	GROUP B (ORGANIC CHEMISTRY)	
	Carbohydrates	
	Isomerism	
	Hydroxy acids	
	GROUP C (PHYSICAL CHEMISTRY)	
	Thermodynamics	
	Chemical Kinetics	
	Colloidal Chemistry	

	P R A C T I C A L
	Preparation of the following compounds 1. Acetanilide from aniline 2. Benzanilide from aniline 3. m-Dinitrobenzene from nitrobenzene 4. Preparation of Benzoic Acid from Ethyl benzoate
SEMESTER IV	GROUP A (INORGANIC CHEMISTRY)
	General discussion of group IIIA and IV elements, Preparation Properties and uses of the following : Hydrazin, Hydrazoic acid. Hydroxylamine, Phosphorous acid, Potassium dichromate, and potassium permanganate.
	Metals
	GROUP B (ORGANIC CHEMISTRY)
	Aromatic compounds
	Important reactions
	GROUP C (PHYSICAL CHEMISTRY)
	Kinetics
	Catalysis
	Electrochemistry
	P R A C T I C A L

A STUDENT IS REQUIRED TO TAKE TWO SUBSIDIARY PAPERS & ONE PAPER IS LANGUAGE & LITERATURE FROM SEMESTER I TO SEMESTER IV.

IN SEMESTER V & VI – ENVIRONMENTAL STUDIES.