

K.K. UNIVERSITY

NALANDA, BIHAR - 803115



SCHOOL OF APPLIED SCIENCES

Bachelor of Science in Chemistry

(Three Year Full Programme)

2022-23



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Pro Vice Chancellor
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Nalanda - 803115 (Bihar)

PROGRAMME STRUCTURE & SYLLABUS

Programme/Course Structure

Year	Semester	Course Code	Course Title	L	T	P	C
1	1	BSCH 1101	PHYSICAL CHEMISTRY-I	3	1	0	4
		BSCH 1102	INORGANIC CHEMISTRY-I	3	1	0	4
		BSCH 1103	ORGANIC CHEMISTRY-I	3	1	0	4
		BSPH-S-1101	PHYSICS-I	3	0	0	3
		BSMT-S-1101	MATHS-I	3	0	0	3
		HNL 1101	Hindi-I	2	0	0	2
		BSCH 1104 P	Practical Chemistry-I	0	0	6	3
	BSPH-S-1101P	Practical Physics-I	0	0	4	2	
	2	BSCH 1201	PHYSICAL CHEMISTRY-II	3	1	0	4
		BSCH 1202	INORGANIC CHEMISTRY-II	3	1	0	4
		BSCH 1203	ORGANIC CHEMISTRY-II	3	1	0	4
		BSPH-S-1201	PHYSICS-II	3	0	0	3
		BSMT-S-1201	MATHS-II	3	0	0	3
		ENL1201	English-I	2	0	0	2
BSCH 1204 P		Practical Chemistry-II	0	0	6	3	
BSPH-S-1201P	Practical Physics-II	0	0	4	2		
2	3	BSCH 2101	PHYSICAL CHEMISTRY-III	3	1	0	4
		BSCH 2102	INORGANIC CHEMISTRY-III	3	1	0	4
		BSCH 2103	ORGANIC CHEMISTRY-III	3	1	0	4
		BSPH-S-2101	PHYSICS-III	3	0	0	3
		BSMT-S-2101	MATHS-III	3	0	0	3
		HNL 2101	Hindi-II	2	0	0	2
		BSCH 2104 P	Practical Chemistry-III	0	0	6	3
	BSPH-S-2101P	Practical Physics-III	0	0	4	2	
	4	BSCH 2201	PHYSICAL CHEMISTRY-IV	3	1	0	4
		BSCH 2202	INORGANIC CHEMISTRY-IV	3	1	0	4
		BSCH 2203	ORGANIC CHEMISTRY-IV	3	1	0	4
		BSPH-S-2201	PHYSICS-IV	3	0	0	3
		BSMT-S-2201	MATHS-IV	3	0	0	3
		HNL 2201	English-II	2	0	0	2
BSCH 2204 P		Practical Chemistry-IV	0	0	6	3	
BSPH-S-2201P	Practical Physics-IV	0	0	4	2		
3	5	BSCH 3101	PHYSICAL CHEMISTRY-V	3	1	0	4
		BSCH 3102	INORGANIC CHEMISTRY-V	3	1	0	4
		BSCH 3103	ORGANIC CHEMISTRY-V	3	1	0	4
		BSCH 3104P	Practical Chemistry-V	0	0	4	2



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		BSCH 3105P	Practical Chemistry-VI	0	0	4	2
6		BSCH 3201	PHYSICAL CHEMISTRY-VI	3	1	0	4
		BSCH 3202	INORGANIC CHEMISTRY-VI	3	1	0	4
		BSCH 3203	ORGANIC CHEMISTRY-VI	3	1	0	4
		BSCH 3204P	Practical Chemistry-VI	0	0	4	2
		BSCH 3205P	Practical Chemistry-VI	0	0	4	2

BSCH 1101: Physical Chemistry-I

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Gaseous State: Kinetic theory of gases, derivation, deduction of gas laws, Maxwell-Boltzmann distribution of velocities, Calculation of most probable, average, root mean square velocity of molecules. Real gases, compressibility factor, various equation of state for real gases, van der Waals equation of state.	8
II	Liquid State: Qualitative treatment of structure of liquid state, radial distribution function, Physical properties of the liquids(molar volume, vapour pressure, surface tension).	8
III	Chemical Equilibrium: Reversible and irreversible reaction, law of mass action and its kinetic derivation, equilibrium constants for homogeneous and heterogeneous reaction, Le Chatelier principle and its application	8
IV	Thermochemistry: Heats in the chemical reaction, reaction enthalpy, Hess law, standard enthalpy change, bond energies and their determination. Thermodynamics-I: Extensive and intensive properties, thermodynamic process, state function.	8
V	Chemical Kinetics: Rate of reaction, order, molecularity, expression for rate constant of first order reaction, half life period, unit.	8
VI	Dilute solution and change of state-I: Colligative properties, osmosis, van't Hoff factor, Raoult's law of lowering vapour pressure, experimental determination.	8



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REFERENCE BOOKS :		
1.	R.C MUKHERJEE	Modern Approach to Physical Chemistry
2.	S.GLASSSTONE	Electrochemistry, Thermodynamics, Chemical Kinetics
3.	GURDEEP & Dr. HARISH	Physical Chemistry
4.	V.K GUPTA & R.G SHARMA	Physical Chemistry

BSCH 1102: Inorganic Chemistry-I

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Atomic Structure: Features of Bohr's interpretation and H-spectra, limitations, refinement of Bohr's theory, shapes of the orbitals and labellings, idea of quantum number, Pauli's Exclusion principle, Hund's rule, Aufbau principle, electronic configuration of elements.	8
II	Bonding models in Inorganic chemistry: Ionic bond: Energetics involved in ionic bond, Born Haber cycle, radius ratio rule, Fajan's rule, Inert pair effect. Covalent Bond: Exceptions to octet rule, idea of orbital overlap, H-Bonding, van der Waals forces.	8
III	Hydrogen and Hydrides: Isotopes of hydrogen, hydrides, covalent, metallic, intermediate, H ₂ O ₂ preparation, properties.	8
IV	Principles of Metallurgy: General methods of extraction, the position of metal in electrochemical series, Gibbs free energy, Calcination, Roasting, Smelting, Electrolytic reduction, Carbon reduction, chromatographic ion exchange, solvent extraction, Mond's process, Van Arkel process, oxidative refining.	8



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V	Molecular symmetry: Symmetry operation, centre of symmetry, axis of symmetry, plane of symmetry Magnetochemistry: Types of magnetic behavior, para, dia, ferromagnetism	8
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REFERENCE BOOKS :		
1.	COOPER H.LANGFORD,D.F SHRIVER,PETER ATKINS	Inorganic Chemistry
2.	3.J.D LEE	(Latest Edition)-Concise Inorganic Chemistry
3.	2.A.SINGH	Text book of Inorganic Chemistry
4.	5.GURDEEP R.CHHATWAL	Advanced Inorganic Chemistry(Part-I,Part-II)
5.	R.K PRASAD	Quantum Chemistry
6.	K.SOMA SEKHAR RAO,K.N.K VANI (KALYANI PUBLISHERS)	Text Book of Co-ordination Chemistry

BSCH 1103: Organic Chemistry-I

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.



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I	Shapes and Structure of Orbital: Hybridisation, Bond angle, idea of bonds, methane, ethane, acetylene, benzene molecules.	8
II	Nomenclature of organic molecules: IUPAC Nomenclature of aliphatic and aromatic compounds.	8
III	Detailed study of compounds: Alcohols, Aldehydes, Ketones, Carboxylic acids, Organometallic compound of Mg, Li.	8
IV	Analytical Techniques: Qualitative and quantitative estimation of C,H,N,S, Halogens in organic compounds, Molecular weight determination of organic acids by silver salt method.	8

REFERENCE BOOKS :		
1.	BHAL & TULI	Text Book of Advanced Organic Chemistry
2.	WILLIAM KEMP	Organic Spectroscopy
3.	NORMAN & COXON	Principles of Organic Synthesis
4.	PETER SYKES	Mechanism in Organic Chemistry
5.	P.S KALSI	Stereochemistry: Conformation and Mechanism
6.	CAREY & SUNDBERG	Advanced Organic Chemistry
7.	O.P AGARWAL	Reaction Mechanism
8.	O.P AGARWAL	(Part-I,Part-II)-Natural products(Organic Chemistry)

BSCH 1104 P: PRACTICAL-I



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L	T	P	Cr
0	0	6	3

PRACTICAL

1.	Volumetric Analysis of Acidimetry and Alkalimetry.
2.	Detection of nitrogen, sulphur, halogen in organic compounds.
3.	Note book and Viva voce.

BSCH 1201: Physical Chemistry-II

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Solid State: Types of solids, crystal forces, seven crystal system, labeling plane, Miller indices, qualitative idea of point and space groups.	8
II	Colloidal state: Definition, classification of colloidal solution, properties of colloids, protection of colloids, application of colloid.	8



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III	Thermodynamics-II: Internal energy, relationship between C_p and C_v , isothermal and adiabatic process of ideal gas, Relationship between P-V-T, elementary idea of entropy, reversible expansion.	8
IV	Ionic Equilibrium: Ionic product of water, pH, pK_a , pK_b , pK_h , buffer solution, buffer capacity, dissociation constant of acid and bases, solubility product, common ion effect, HSAB principle.	8
V	Changes of state: Elevation of boiling point, depression of freezing point, abnormal colligative properties.	8
VI	Processes at solid surface: Adsorption, idea of catalytic activity on surface, oxidation, cracking, reforming.	8

REFERENCE BOOKS :		
1.	R.C MUKHERJEE	Modern Approach to Physical Chemistry
2.	S.GLASSSTONE	Electrochemistry, Thermodynamics, Chemical Kinetics
3.	GURDEEP & Dr. HARISH	Physical Chemistry
4.	V.K GUPTA & R.G SHARMA	Physical Chemistry

BSCH 1202: Inorganic Chemistry-II

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Nomenclature of Inorganic compounds: IUPAC names , names for ions, radicals, poly ions.	8




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II	Acid-Base Chemistry: Bronsted-Lowry concept, Lewis concept, periodic trends of acid strength, HSAB concept.	8
III	Periodicity: Fundamental trends of atomic/ionic radii, ionization energy, electronegativity, d orbitals, periodic anomalies	8
IV	Chemistry of following metals: Li,Be,Sn, Chemistry of halogens with reference to extraction, oxidation state.	8
V	Principles involved in volumetric estimation of Cu^{2+} , Ca^{2+} . Principles involved in gravimetric estimation of Ba^{2+} , Ni^{2+} , Mg^{2+} . Isotopes and Radio carbon dating.	8

REFERENCE BOOKS :		
1.	COOPER H.LANGFORD,D.F SHRIVER,PETER ATKINS	Inorganic Chemistry
2.	3.J.D LEE	(Latest Edition)-Concise Inorganic Chemistry
3.	2.A.SINGH	Text book of Inorganic Chemistry
4.	5.GURDEEP R.CHHATWAL	Advanced Inorganic Chemistry(Part-I,Part-II)
5.	R.K PRASAD	Quantum Chemistry
6.	K.SOMA SEKHAR RAO,K.N.K VANI (KALYANI PUBLISHERS)	Text Book of Co-ordination Chemistry

BSCH 1203: Organic Chemistry-II

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.



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I	Introduction to the organic reaction mechanism: Inductive effect, Electromeric effect, mesomeric effect, bond fission and fusion.	8
II	Stereochemistry: Idea of geometrical and optical isomerism.	8
III	Amines and Urea: Preparation, identification and organosulphur compounds.	8
IV	Aromaticity and structure of Benzene: Monosubstituted benzene, directive influence of different groups in benzene.	8
V	Purification of organic compounds: Chromatography, criteria of purity.	8
VI	Synthetic fibres, plastics, soaps, detergents and their chemistry	8

REFERENCE BOOKS :		
1.	BHAL & TULI	Text Book of Advanced Organic Chemistry
2.	WILLIAM KEMP	Organic Spectroscopy
3.	NORMAN & COXON	Principles of Organic Synthesis
4.	PETER SYKES	Mechanism in Organic Chemistry
5.	P.S KALSI	Stereochemistry: Conformation and Mechanism
6.	CAREY & SUNDBERG	Advanced Organic Chemistry
7.	O.P AGARWAL	Reaction Mechanism
8.	O.P AGARWAL	(Part-I, Part-II)-Natural products (Organic Chemistry)

BSCH 1204 P: PRACTICAL-II

L	T	P	Cr
0	0	6	3



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PRACTICAL	
1.	Volumetric Analysis of Potassium permanganate and Sodium thiosulphate.
2.	Identification of organic compounds containing one functional group including monosaccharides.
3.	Note book and Viva voce.

BSCH 2101: Physical Chemistry-III

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Gaseous state: Critical phenomena, intermolecular forces, liquefaction of gases, law of corresponding states, relation between critical constants and van der Waals constants.	8
II	Liquid State: Critical temperature, physical properties of liquids: viscosity, refractive index, idea of liquid crystal.	8
III	Thermodynamics: Second law of thermodynamics, Carnot cycle, entropy change in reversible and irreversible processes, free energy and work function, Gibbs–Helmholtz equation, Clausius-Clapeyron equation.	8
IV	Ionic Equilibrium: Ostwald's Dilution law, salt hydrolysis, conductance, degree of ionization, hydrolysis constant.	8
V	Chemical Kinetics: Rate constant of second order reaction, Arrhenius equation, effect of catalyst on reaction rate, saponification of ester, hydrolysis of methyl acetate.	8
VI	Catalysis: Definition and classification of catalyst, acid-base catalysis, enzyme catalysis, promoter, poison.	8



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3.	GURDEEP & Dr. HARISH	Physical Chemistry
4.	V.K GUPTA & R.G SHARMA	Physical Chemistry

BSCH 2102: Inorganic Chemistry-III

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Atomic structure: Determination of electronic charge, dual nature of electrons, uncertainty principle, idea of excited state and ground state	8
II	Bonding Models: Expansion of valence –bond theory, Structure of BF ₃ ,NH ₃ ,PCl ₅ ,SF ₄ ,Metallic bond.	8
III	General chemistry: Structure and bonding of noble gas, pseudo halogens.	8
IV	Introduction to the transition metal chemistry: Oxidation state, ionic sizes, magnetism, complexes.	8
V	Spectroscopy: Elementary ideas of UV-VIS,IR spectroscopy. Analytical chemistry: Use of complexation reaction by EDTA, DIMETHYL GLYOXIME in inorganic analysis.	8

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1.	COOPER H.LANGFORD,D.F SHRIVER,PETER ATKINS	Inorganic Chemistry
2.	3.J.D LEE	(Latest Edition)-Concise Inorganic Chemistry
3.	2.A.SINGH	Text book of Inorganic Chemistry
4.	5.GURDEEP R.CHHATWAL	Advanced Inorganic Chemistry(Part-I,Part-II)
5.	R.K PRASAD	Quantum Chemistry
6.	K.SOMA SEKHAR RAO,K.N.K VANI (KALYANI PUBLISHERS)	Text Book of Co-ordination Chemistry



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BSCH 2103: Organic Chemistry-III

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Stereochemistry: E-Z,D,L,R-S modes of nomenclature, idea of asymmetry,dissymmetry,keto-enol tautomerism, enantiomer, diastereoisomer.	8
II	Nomenclature and classification of glucose, fructose, ring structure, Kiliani-Fischer synthesis, Osazone inter conversion	8
III	Aromaticity and Huckel's Rule: Preparation and properties of benzene, nitrobenzene, benzaldehyde, benzoic acid,aniline, diazonium salt.	8
IV	Applied chemistry: Synthetic application of AlCl ₃ , brief introduction of TLC paper, gas chromatography	8

REFERENCE BOOKS :		
1.	BHAL & TULI	Text Book of Advanced Organic Chemistry
2.	WILLIAM KEMP	Organic Spectroscopy
3.	NORMAN & COXON	Principles of Organic Synthesis
4.	PETER SYKES	Mechanism in Organic Chemistry
5.	P.S KALSI	Stereochemistry: Conformation and Mechanism
6.	CAREY & SUNDBERG	Advanced Organic Chemistry
7.	O.P AGARWAL	Reaction Mechanism
8.	O.P AGARWAL	(Part-I, Part-II)-Natural products(Organic Chemistry)



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BSCH 2104 P: PRACTICAL-III

L	T	P	Cr
0	0	6	3

PRACTICAL

1.	Determination of molecular weight of volatile liquid by Victor-Meyer method.
2.	Determination of Surface tension of liquid using Stalagmeter.
3.	Determination of molecular weight of volatile liquid by Duma's bulb method
4.	Determination of coefficient of viscosity of liquids using Ostwald Viscometer.
5.	Gravimetric analysis of Ag^+ , Ba^{2+} , Cl^- .
6.	Note book and Viva voce.

BSCH2201: Physical Chemistry-IV

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Solid State: Bragg's law, Lattice energy and calculation, crystal structure of KCl, ZnS, NaCl, Radius ratio rule, co-ordination number.	8
II	Colloids: Lyophilic and lyophobic colloids, coagulation, Tyndall effect, Brownian movement, electrophoresis, Hardy-Schulze rule, emulsion.	8
III	Phase equilibrium: Phase rule, one component, two component solid-liquid system, azeotropic mixture, eutectic mixture.	8
IV	Distribution law: Nernst distribution law, factors affecting partition co-efficient, thermodynamic derivation.	8
V	Conductance: Electrolytes, equivalent, molecular conductance, Kohlrausch's law of independent migration, application.	8



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VI	Electrochemical cell: Reversible, irreversible cell, electrode potential, Nernst equation, redox titration.	8
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REFERENCE BOOKS :		
1.	R.C MUKHERJEE	Modern Approach to Physical Chemistry
2.	S.GLASSSTONE	Electrochemistry, Thermodynamics, Chemical Kinetics
3.	GURDEEP & Dr. HARISH	Physical Chemistry
4.	V.K GUPTA & R.G SHARMA	Physical Chemistry

BSCH 2202: Inorganic Chemistry-IV

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	General chemistry of elements: Oxidation states, halides, complexes of Sc, La, Y, Ti, V, Fe, Co, Ni	8
II	Chemistry of group 14 elements: Carbides, silicates of C, Si, Ge.	8
III	Oxidation and Reduction: Redox half reaction. redox stability of water.	8
IV	Applied chemistry: Chemistry of Cement, steel, chemical pollutants, fuel.	8

REFERENCE BOOKS :		
1.	COOPER H.LANGFORD, D.F SHRIVER, PETER ATKINS	Inorganic Chemistry
2.	3.J.D LEE	(Latest Edition)-Concise Inorganic Chemistry
3.	2.A.SINGH	Text book of Inorganic Chemistry
4.	5.GURDEEP R.CHHATWAL	Advanced Inorganic Chemistry(Part-I,Part-II)
5.	R.K PRASAD	Quantum Chemistry
6.	K.SOMA SEKHAR RAO, K.N.K VANI (KALYANI PUBLISHERS)	Text Book of Co-ordination Chemistry



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BSCH 2203: Organic Chemistry-IV

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Reaction mechanism: Electrophilic and nucleophilic substitution reaction in benzene.	8
II	Name reaction in organic chemistry Hydroxy acid: Preparation of lactic acid, citric acid, stereochemistry of hydroxy acids.	8
III	Polymethelene and Bayer's strain theory	8
IV	Applied chemistry: Organic polymers and resins, proteins.	8

REFERENCE BOOKS :		
1.	BHAL & TULI	Text Book of Advanced Organic Chemistry
2.	WILLIAM KEMP	Organic Spectroscopy
3.	NORMAN & COXON	Principles of Organic Synthesis
4.	PETER SYKES	Mechanism in Organic Chemistry
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BSCH 2204P: PRACTICAL-IV

L	T	P	Cr
0	0	6	3

PRACTICAL	
1.	Determination of partition coefficient of solutes between two immiscible liquids.
2.	Determination of rate constant of hydrolysis of esters by H^+ ions at room temperature.
3.	Determination of refractive index of liquids by refractometer.
4.	Gravimetric analysis of Ni^{2+} , Ba^{2+} , SO_4^{2-}
5.	Note book and Viva voce.

BSCH 3101: Physical Chemistry-V

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Gaseous State: Collision number and collision frequency, relation between mean free path and coefficient of viscosity, determination of Avogadro number.	8
II	Solid state: Crystal forces, radius ratio, stoichiometry, non-stoichiometry.	8



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III	Equilibrium: Molal elevation and depression constants, van't Hoff equation, partial molar quantities.	8
IV	Phase equilibrium: Three component system, partially miscible liquids, phase diagram	8
V	Chemical kinetics: Third order reaction, kinetics of complex reaction, consecutive reaction, opposing reaction.	8
VI	Electrochemistry: EMF, Liquid junction potential, calomel electrode, hydrogen electrode, glass electrode.	8

REFERENCE BOOKS :		
1.	R.C MUKHERJEE	Modern Approach to Physical Chemistry
2.	S.GLASSSTONE	Electrochemistry, Thermodynamics, Chemical Kinetics
3.	GURDEEP & Dr. HARISH	Physical Chemistry
4.	V.K GUPTA & R.G SHARMA	Physical Chemistry

BSCH 3102: Inorganic Chemistry-V

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Atomic structure: Schrodinger wave equation and its application, probability density function, significance of wave function.	8
II	Bonding Models: LCAO combination, Antibonding, bonding, bond order. efficiency of packing, factors of radius ratio, electronic structure of carbonate, nitrate, sulphate ion.	8
III	Complex formation in block elements, general chemistry of oxygen, sulphur, selenium, nitrogen, phosphorous.	8



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IV	Organometallic chemistry: EAN rule, elementary idea of carbonyl, nitrosyl, ferrocene.	8
V	Inorganic chemistry in biological system: Elementary idea of role of Na, Mg, Ca, Fe	8

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1.	COOPER H. LANGFORD, D.F SHRIVER, PETER ATKINS	Inorganic Chemistry
2.	3. J.D LEE	(Latest Edition)-Concise Inorganic Chemistry
3.	2. A. SINGH	Text book of Inorganic Chemistry
4.	5. GURDEEP R. CHHATWAL	Advanced Inorganic Chemistry (Part-I, Part-II)
5.	R.K PRASAD	Quantum Chemistry
6.	K.SOMA SEKHAR RAO, K.N.K VANI (KALYANI PUBLISHERS)	Text Book of Co-ordination Chemistry

BSCH 3103: Organic Chemistry-V

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	General principle: Hyperconjugation, carbocation, carbanion, benzyne system.	8
II	Types of reaction: Nucleophilic, electrophilic addition, substitution reaction in saturated and unsaturated system, Saytzeff rule.	8
III	Polynuclear hydrocarbon: Naphthalene, Anthracene, Amino acids.	8
IV	Heterocyclic compounds: Furan, Thiophene, Pyrrole, Pyridine.	8



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7.	O.P AGARWAL	Reaction Mechanism
8.	O.P AGARWAL	(Part-I, Part-II)-Natural products(Organic Chemistry)

BSCH 3104P: PRACTICAL-V

L	T	P	Cr
0	0	6	3

PRACTICAL	
1.	INORGANIC- Qualitative inorganic analysis of Ag^+ , Hg^{2+} , Fe^{3+} , Ni^{2+} , Co^{2+} , SO_4^{2-} , CO_3^{2-}



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BSCH 3105P: PRACTICAL-VI

L	T	P	Cr
0	0	6	3

PRACTICAL

1.	ORGANIC -Acetylation of salicylic acid, preparation of benzalidine, preparation of ethyl benzoate.
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BSCH 3201:Physical Chemistry-VI

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Spectroscopy: Basic principles of IR,UV-VIS spectroscopy	8
II	Photochemistry: Lambert-Beerlaw,Photochemical reaction,Phosphorence,Fluorescence,quantum yield.	8



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III	Wave mechanics: Idea to operators, uncertainty principle, Schrodinger wave equation.\	8
IV	Dynamic electrochemistry: Transport number, mean activity, over potential, corrosion, fuel cell.	8

REFERENCE BOOKS :		
1.	R.C MUKHERJEE	Modern Approach to Physical Chemistry
2.	S.GLASSSTONE	Electrochemistry, Thermodynamics, Chemical Kinetics
3.	GURDEEP & Dr. HARISH	Physical Chemistry
4.	V.K GUPTA & R.G SHARMA	Physical Chemistry

BSCH 3202: Inorganic Chemistry-VI

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.
I	Co-ordination chemistry: CFSE Calculation, chelates, CF splitting.	8



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II	Metallic bonding: MO method of explaining bonding in metals, superconductivity.	8
III	Nuclear Chemistry: Binding energy and stability of nucleus,radioactive decay,potential decay constant,potential barrier. Comparative chemistry of Cr, Mn, Mo with respect to oxidation,complex,position ,formation of organometallic compound.	8
IV	General chemistry of f- block elements.	8
V	Raman ,Mossbauer spectroscopy.	8
VI	Inorganic chain,ring,cages,clusters: Borazines,boranes,hetero poly anions.	8

REFERENCE BOOKS :		
1.	COOPER H.LANGFORD,D.F SHRIVER,PETER ATKINS	Inorganic Chemistry
2.	J.D LEE	(Latest Edition)-Concise Inorganic Chemistry
3.	A.SINGH	Text book of Inorganic Chemistry
4.	GURDEEP R.CHHATWAL	Advanced Inorganic Chemistry(Part-I,Part-II)
5.	R.K PRASAD	Quantum Chemistry
6.	K.SOMA SEKHAR RAO,K.N.K VANI (KALYANI PUBLISHERS)	Text Book of Co-ordination Chemistry

BSCH 3203: Organic Chemistry-VI

L	T	P	Cr
3	1	0	4

UNITS	CONTENTS	Contact Hrs.



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I	Name reaction and rearrangement of aromatic compounds	8
II	Dyes: Azo,Zanthene dye,natural colouring pigment,anthocyanins etc.	8
III	Alkaloids and Terpenes: Isolation and structural elucidation.	8
IV	Analytical and Applied Organic Chemistry: Antibiotics,sulphadruugs,synthetic fuel,eplosive,adhesive,antiseptics,analgesics,insecticides.	8

REFERENCE BOOKS :		
1.	BHAL & TULI	Text Book of Advanced Organic Chemistry
2.	WILLIAM KEMP	Organic Spectroscopy
3.	NORMAN & COXON	Principles of Organic Synthesis
4.	PETER SYKES	Mechanism in Organic Chemistry
5.	P.S KALSI	Stereochemistry: Conformation and Mechanism
6.	CAREY & SUNDBERG	Advanced Organic Chemistry
7.	O.P AGARWAL	Reaction Mechanism
8.	O.P AGARWAL	(Part-I, Part-II)-Natural products(Organic Chemistry)

BSCH 3204P:PRACTICAL-VII

L	T	P	Cr
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0	0	6	3
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PRACTICAL

1. **INORGANIC**- Qualitative inorganic analysis of Ca^{2+} , Ba^{2+} , Sr^{2+} , Na^+ , K^+ , S^{2-} , NO_3^{2-} .

BSCH 3205P:PRACTICAL-VIII

L	T	P	Cr
0	0	6	3

PRACTICAL

1. **ORGANIC**-Preparation of para nitro acetanilide, Preparation of benzoic acid from benzaldehyde



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