

GOVERNMENT COLLEGE BIROHAR (JHAJJAR)

Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: RAJESH KUMAR

Class: B.Sc. Ist

Subject: CHEMISTRY

Semester: Ist

Months	Topics/Chapters to be Covered
AUGUST 2022	UNIT:- Structure and Bonding w.e.d. 22.8.22 Localised and Delocalised Bond Vander Waals Interactions.
September 2022	Resonance with its conditions, Resonance Effect and its application in organic chemistry. Hyperconjugation with its utility. Inductive effect with its type +I, -I effect. Electromeric effect with its type -E and +E-effect. Comparison b/w Electromeric and Inductive effect. Revision of the whole chapter. * Take the test of Ist Chapter. check and Distribute to students.
October 2022	Chapter:- Stereochemistry of Organic Compounds. → Concept of Isomerism and its type. Optical isomerism - Elements of symmetry, molecular chirality, optical Activity, Chiral, achiral comp, Diastereomers, meso comp., Threo and Erythro, resolution, Inversion, retention and Racemisation. Relative, absolute configuration, Sequence rule. R and S Nomenclature, Geometric isomerism, E, Z Nomenclature, Conformational Isomerism - Conformations of ethane, n-butane, Cyclohexane, axial and equatorial bonds. Sawhorse and Newmann Projection formula. Prepare assignment for this unit.

November
2022

Chapter 3rd - Mechanism of Organic Reactions.

Curved arrow notation, Drawing e^- movement with arrows, half a full headed arrow, Homolytic, Heterolytic cleavage of bond. Types of reagents - Electrophiles and Nucleophiles. Types of organic reactions. Reactive Intermediates - Carbocation, Carbanion, Free radical, Carbene :- Formation, their types, stability, reactivity and structure.
* Took the test, checked and distributed among students.

December
2022

Chapter 5th Alkanes and Cycloalkanes:-

IUPAC Nomenclature of branched and unbranched alkane, classification of carbon atoms in alkane, Isomerism in alkane, methods of formation of alkane i.e. Wurtz, Kolbe, Corey-House, decarboxylation. Physical Properties of Alkanes. Mechanism of free radical halogenation of alkanes :- reactivity and selectivity. Cycloalkanes - Nomenclature, synthesis and their derivatives :- (2+2) cycloaddition, R^+ Dehydrogenation of α, ω Dihalides. Bayer's strain Theory and its limitation. Theory of strained ring. Revise the chapter and ask questions orally with the students. Revise whole syllabus at a glance.

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: RATESH KUMAR

Class: B.Sc. 2nd Subject: CHEMISTRY

Semester: 3rd

Topics/Chapters to be Covered

W.P.F. 1608-22

Months	Topics/Chapters to be Covered
GUEST 2022	Chapter - I & Chemistry of d-Block Elements Definition of Transition Elements. Difference between d-Block and Transition Elements.
September 2022	Position of transition Elements in the Periodic Table. General characteristics and Properties of d-Block Elements. Comparison of properties of 3d elements with 4d and 5d elements with reference to only ionic radius, oxidation state, magnetic and spectral properties and Stereochemistry. Recurse these topics and ask questions orally among the students.
October 2022	Stability of various oxidation states and E.M.F. (Latimer and Frost Diagram), Structures and Properties of some compounds of transition Elements. i.e. TiO_2, $VOCl_3$, $FeCl_3$, $CuCl_2$ and $Ni(SO)_4$. Chapter = 2 <u>Co-Ordination Compounds</u> Werner's theory of co-ordination compounds, Effective atomic number, Chelates.

November
2022

Nomenclature of coordination compounds. Isomerism in coordination compounds.
Valence Bond Theory of Transition metal complexes with various examples. Submit assignment of coordination compound unit. Revise chapter thoroughly.

Chapter 3rd

Non-Aqueous Solvents

Physical Properties of Solvents
Types of solvents.

December
2022

- General characteristics of solvents.
- Reactions in non-aqueous solvents with reference to liquid NH_3 .
- Reactions in non-aqueous solvents with reference to liquid SO_2 .
- Prepare students for Group-Discussion on various topics.
- Revision of all syllabus as a whole.

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: RAJESH KUMAR

Class: B.Sc 3rd Subject: CHEMISTRY

Semester: 5th Sem.

Months	Topics/Chapters to be Covered w.e.g. - 16-08-22
AUGUST 2022	Chapter-1st $\rightarrow$ <u>Metal-ligand Bonding in Transition Metal Complexes</u>
	Limitations of valence bond Theory
	$\rightarrow$ Revision of valence Bond Theory
	$\rightarrow$ Nomenclature of Coordination compounds with Werner's theory.
September 2022	An Elementary idea of crystal-field theory.
	Crystal field splitting in octahedral complexes
	Crystal field splitting in square planar complexes
	Factors affecting the crystal-field parameters. Take the test, check it and Distribute among students.
October 2022	<u>Chapter 2nd</u> Thermodynamic and kinetic aspect of metal complex
	A brief outline of thermodynamic and kinetic stable unstable, labile and inert complexes
	A brief outline of thermodynamic stability of metal complexes and factors affecting the stability of complexes. Irving Williams Series.
	Substitution reactions of Square planar complexes of Pt II complexes. Trans-Effect with their theories in Detail. Prepare assignment and submit it
	<u>Chapter 3rd</u> Magnetic Properties of Transition Metal Complexes
	Types of magnetic materials, magnetic susceptibility

November
2022

→ Methods of determining magnetic susceptibility, spin-only formula, L-S Coupling, correlation of μ_B and μ_{eff} values, orbital contribution to magnetic moments, application of magnetic moment data for 3d-metal complexes. Conduct group discussion of this chapter for students.

Chapter-4th Electronic Spectra of Metal Complexes

→ Rules for d-d transition
→ Spectroscopic ground states.

December
2022

Spectrochemical Series. Orgel-Energy Level Diagram for d^1 and d^n states. Discussion of the electronic spectrum of $[Ti(NO_3)_6]^{3+}$ complex ion. Revision of the chapter act as a whole syllabus at a glance. Prepare for the Semester Exam.

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: SHIVANI

Class: B.Sc. Ist Sem Subject: Physical Chemistry

Semester: Ist Semester

Months	Topics/Chapters to be Covered
AUGUST 2022	<u>Gaseous states</u>: Maxwell's distribution of velocities and energies (derivative excluded). Calculation of root mean square velocity, average velocity & most probable velocity. Collision diameter, collision numbers, collision frequency and mean free path. Deviation of Real gases from ideal behaviour. Derivation of van der Waal's Equation of State application in the calculation of Boyle's temperature (compression factor) Explanation of behaviour of real
September 2022	<u>Critical Phenomenon</u>: Critical temperature, Critical pressure, Critical volume and the determination. PV isotherms of real gases, continuity of states, the isotherms of van der Waal's equation, relationship between critical constants and van der Waal's constants. Critical compressibility factor. The law of corresponding states. Liquefaction of gases. Assignment: on Liquid states.
October 2022	<u>Liquid states</u>: - Structure of liquids, Properties of liquids - Surface tension, viscosity, vapour pressure and optical rotation and their determination. Unit Test I $\Rightarrow$ on Gaseous states.

November
2022

Solid states :- Classification of Solids, Law of Crystallography - (i) Law of constancy of interfacial angles. (ii) Law of rational indices (iii) Law of Symmetry. Symmetry elements / Definition of unit cell and space lattice. Bravais's lattices, crystal system. X-ray diffraction by crystals. Derivation of Bragg's equation. Derivation of crystal structure of NaCl, KCl.

December
2022

Liquid crystals :- Difference between solids, liquids and liquid crystals, types of liquid crystals.
Application of liquid crystals.

Shivani

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: SHIVANI

Class: B.Sc. IInd Year Subject: Organic Chemistry

Semester: IIIrd Semester

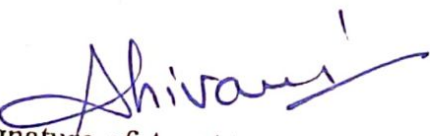
Months	Topics/Chapters to be Covered
AUGUST 2022	Monohydric Alcohols - nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding - Acidic Nature, Reactions of Alcohols.
September 2022	Dihydric Alcohols - nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [$\text{Pb}(\text{OAc})_4$ and HIO_4] and pinacol - pinacolone rearrangement. Phenols: - Nomenclature, structure and bonding. Preparation of phenols, physical properties and acidic character, comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion. Reactions of phenols - electrophilic aromatic substitution, Fries rearrangement, Claisen.
October 2022	Epoxides: - Synthesis, Acid & Base catalyzed ring opening of epoxides, orientation of epoxide ring opening, reactions of Grignard and organolithium reagents with epoxides. Unit Test I => Alcohols and Phenols. Carboxylic Acids and Acid Derivatives: Nomenclature of carboxylic acids, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents.

November
2022

on acid strength. Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. Reduction of carboxylic acids. Mechanism of decarboxylation. Relative stability of acyl derivatives. Physical properties, interference of acid derivatives by nucleophilic acyl substitution. Mechanisms of esterification and hydrolysis (acidic and basic). Assignment on Epoxides

December
2022

Ultraviolet absorption spectroscopy = Absorption laws (Beer-Lambert law), molar absorptivity, presentation and analysis of UV spectra, types of electronic transition, effect of conjugation. Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic & hypochromic shifts. UV spectra of conjugated enes and enones, Woodward-Fieser rules, calculation of λ_{max} of simple conjugated dienes and α, β -unsaturated ketones. Application of UV spectroscopy in structure elucidation of simple organic compounds.


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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: SHIVANI

Class: B.Sc. IIIrd Year

Subject: Organic Chemistry.

Semester: Vth Semester

Months	Topics/Chapters to be Covered
AUGUST 2022	NMR Spectroscopy - I: Principles of nuclear magnetic resonance, the PMR spectrum, of signals, peak areas, equivalent and chemical shift. Position of signals protons, proton counting, splitting of signals and coupling constants and equivalence of protons.
September 2022	NMR Spectroscopy - II: Discussion of PMR spectra of the molecules: ethyl bromide, n-propyl bromide, isopropyl bromide, 1,1-dibromoethane, 1,1,2,2-tetrabromoethane, ethanol, acetaldehyde, ethyl acetate, benzaldehyde and acetophenone. Simple problems on PMR spectroscopy for structure determination of organic compounds.
October 2022	Carbohydrates - I: Classification and nomenclature of monosaccharides & mechanism of osazone formation. Interconversion of glucose and fructose. Chain length and chain shortening of aldehydes. Configuration of monosaccharides. D-glucose and D-fructose. Conversion of glucose into mannose. Fischer projection of glucose and fructose. Determination of ring size of glucose and fructose. Open chain and cyclic structure of D(-) glucose and D(+)-fructose. Mechanism of mutarotation. Structure of ribose and deoxy ribose.

November
2022

Carbohydrates II - An introduction of
disaccharides (maltose, sucrose and lactose)
and polysaccharides (starch and cellulose)
without involving structure determination.
Unit Test I
Assignment I

December
2022

Organometallic Compounds: Organomagnesium
Compounds: The Grignard reagents -
formation abstracting and chemical reactions
Organizing Compounds: formation and
chemical reactions
Organolithium Compounds: formation and
chemical reactions.


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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Dr. Narendran Singh
Class: B.Sc. IInd Subject: Maths Advanced Calculus
Semester: 3rd

Maths	Topics/Chapters to be Covered
QUEST 22	Continuity, sequential Continuity. Properties of Continuous functions.
umber 2	Uniform Continuity, chain rule of differentiability, mean value theorems, Rolle's theorem and Lagrange's mean value theorem and their geometrical interpretations. Taylor's theorem with various form of remainders, Darboux intermediate value theorem for derivatives, Indeterminate forms
ber 2	Limit and Continuity of real valued functions of two variables. Partial differentiation. Total differentials, composite functions and implicit functions change of variables, Homogeneous functions and Euler's theorem on homogeneous functions. Taylor's theorem for function of two variables, ...

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GOVERNMENT COLLEGE BIROHAR (JHAJJAR)

Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Dr. Narendra Singh

Class: B.Sc. IInd

Subject: Maths Advanced Calculus

Semester: 3rd

Topics/Chapters to be Covered

Months	Topics/Chapters to be Covered
AUGUST 2022	Continuity, sequential continuity. properties of continuous functions.
September 2022	Uniform Continuity, chain rule of differentiability, mean value theorems, Rolle's theorem and Lagrange's mean value theorem and their geometrical interpretations. Taylor's theorem with various form of remainder, Darboux intermediate value theorem for derivatives, Indeterminate forms
October 2022	Limit and Continuity of real valued functions of two variables. Partial differentiation. Total differentials, composite functions and implicit functions change of variables, Homogeneous functions and Euler's theorem on homogeneous functions. Taylor's theorem for function of two variables, ..

November
2022

Differentiability of real valued functions of
two variables. Schwarz and Young's theorems
Implicit function theorem. maxima, minima
and saddle points of two variables.
Lagrange's method of multipliers. Curves
Tangent Principal normals, Binormals,
Serret-Frenet formulae. Locus of Centre of
Curvature, spherical curve, Locus of of spherical curve

December
2022

Involute Evolutes, Bertrand Curves Surface:
Tangent planes, one parameter family of surfaces
Envelopes.

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: NARENDER SINGH

Class: B.Sc 3rd

Subject: Practical in Numerical Analysis

Semester: 5

Months	Topics/Chapters to be Covered
AUGUST 2022	Practicals. Write a program to demonstrate Newton-Forward Interpolation formula and draw the flow chart
September 2022	Programme and flow charts for Newton-Backward interpolation, Lagrange's Interpolation formula, and Trapezoidal rule.
October 2022	program and flow charts Simpson's one-third rule and Simpson's $\frac{3}{8}$ rule

November
2022

Programme and flow chart for
Euler's method, Euler's modified method
and Runge-Kutta fourth order method.

December
2022

Programme to demonstrate Milne
Simpson method and draw the
flow chart.


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GOVERNMENT COLLEGE BIRCHHILL (H.C. 11-12)

Institute of Learning Skills of 21st Century Canada, for September Session 2022-23

Name of Student: Amal Kumar Singh

Class: B.C. 1st Subject: English

Section: 1st

Topics/Chapters to be Covered

Month

AUGUST
2022

Lesson 10: July and "Character of Time"

September
2022

Lesson 1: "Let Me Tell to the Marriage of Time"

Lesson 2: "Let Me Tell to the Marriage of Time"

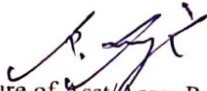
October
2022

Lesson 2: "On the Blindness"

Lesson 1: "The Artist"

Lesson 1: "The Artist"

November 2022	Poem 6. "Know Thyself"
	Poem 7. "The Little Black Boy"
	Poem 8. "Three Years She Grew in Sun and Shower"
	Poem 9. "England in 1819"
	Poem 10. "Crossing the Bar"
December 2022	Grammar Week:
	a) Translation from Hindi to English
	b) Paragraph Writing
	c) Common Phrasal Verbs, Prepositions and Common Errors in English.


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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Dr. Seetu Singh

Class: B.Sc. I Year Subject: Inorganic Chemistry

Semester: II Sem.

Months	Topics/Chapters to be Covered
AUGUST 2022	<u>Atomic Structure</u> :- Idea of de-Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, quantum numbers, radial and angular wave functions and probability distribution curves, shapes of s, p, d, orbitals.
September 2022	<u>Periodic Properties</u> :- General principles of periodic table, Aufbau and Pauli exclusion principle, Hund's multiplicity rule, Electronic configuration of the elements, effective nuclear charge, Slater's rules. Atomic and ionic radii, ionization energy, electron affinity and electronegativity - definition, methods of determination and trends in periodic table. <u>Test</u> :-
October 2022	<u>Covalent Bond</u> :- Valence bond theory and its limitation, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions, (BeF_2, BF_3, CH_4, PF_5, SF_6, IF_7, SO_4^{2-}, ClO_4^-) Valence shell electron pair repulsion theory to NH_3, H_3O^+, SF_4, ClF_3, ICl_2^- and H_2O, MO theory

November
2022

of heteronuclear (CO and NO) diatomic molecules, bond strength and bond energy, percentage ionic character from dipole moment and electronegativity difference.

December
2022

Ionic Solids :- Ionic Structures (NaCl , CsCl , ZnS , CaF_2) radius ratio effect and coordination number, limitation of radius ratio rule, lattice defects, Semiconductors, lattice energy and Born-Haber cycle, Solvation energy and its relation with solubility of ionic solid, polarising power and polarisability of ions, Fajan's rule.

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Dr. Seetu Singh

Class: B.Sc. II Year Subject: C Physical Chemistry

Semester: 3rd

Months	Topics/Chapters to be Covered
AUGUST 2022	<u>Thermodynamics - I</u> :- Definition of thermodynamics terms - System, Surrounding, Type of Systems, intensive & extensive properties, State & Path function and their differentials, Thermodynamic process, Concept of heat and work, Zeroth law of thermodynamics, First law of thermodynamics, Statement definition of internal energy and enthalpy.
September 2022	Heat Capacity, heat capacities at constant volume and pressure and their relationship, Joule's law, Joule - Thomson coefficient for ideal gas and real gas and inversion temp. (Test -)
October 2022	<u>Thermodynamics - II</u> :- Calculation of w , q , du and dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process, Temperature dependence of enthalpy, Kirchhoff's equation, Bond energies and applications of bond energies. <u>Chemical Equilibrium</u> :- Equilibrium constant and free energy, concept of Chemical potential, Thermodynamic derivation of law of Chemical equilibrium, Temperature dependence of equilibrium constant, (Test -)

November 2022	Van't Hoff reaction isochore, Van't Hoff reaction isotherm. Le - Chatelier principle and its applications, Clapeyron equation and Clausius - Clapeyron equation, its application.
December 2022	<u>Distribution Law</u> :- Nernst distribution law its thermodynamic derivation, Modification of distribution law when solute undergoes dissociation association and combination, Application of distribution law.

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Dr. Seetu Singh
 Class: B.Sc III Year Subject: Physical Chemistry
 Semester: Vth

Months	Topics/Chapters to be Covered
AUGUST 2022	<u>Quantum Mechanics</u> - Black-body radiation, Planck's radiation law, Photoelectric effect, heat capacity of Solids, Compton effect, wave function and its significance, Postulates of quantum mechanics, quantum mechanical operator, commutation relations, Hamiltonian operator, Hermitian operator, average value of square of Hermitian as a positive quantity, Role of operators in quantum mechanics, To show quantum mechanically that position & momentum cannot be predicted simultaneously,
September 2022	Determination of wave function & energy of a particle in one dimensional box pictorial representation and its significance.
October 2022	<u>Physical Properties and Molecular Structure</u> - Optical activity, Polarization - (Clausius - Mossotti eq.) Orientation of dipoles in an electric field, dipole moment, induced dipole moment, measurement of dipole moment - temp. method and refractivity method, Dipole moment and structure of molecules, Magnetic permeability, Magnetic susceptibility and its determination, Application of magnetic susceptibility, Magnetic properties, paramagnetism, diamagnetism & ferromagnetism. (Text)
	<u>Spectroscopy-I</u> - Introduction - Electromagnetic radiation, regions of spectrum, basic features of spectroscopy, Statement of Bohr - Sommerfeld approximation, Degrees of freedom

November
2022

Rotational Spectrum:- Diatomic molecules, Energy levels of rigid rotor, Selection rules, spectral intensity distribution using population distribution, determination of bond length, qualitative description of non-rigid rotor, isotope effect.

December
2022

Spectroscopy-II:- Infrared spectrum, Energy levels of simple harmonic oscillator, Selection rules, pure vibrational spectrum, intensity determination of force constant and qualitative relation of force constant and bond energies, effects of anharmonic motion and isotopic effect on the spectra, idea of vibrational frequencies of different functional gr. (Test)

Raman Spectrum:- Concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic mole, selection rules, quantum theory of Raman spectra.

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Name of _____

MANJU KUMAR

Class: B.Sc I

Electricity

Semester: I

Months	Covered
AUGUST 2022	Mathematical Background: Scalars and vectors, dot and cross product, Triple vector, scalar and vector field, Differentiation of a vector, Gradient of a scalar and its physical significance, Integration of a vector (line, surface and volume integral and their physical significance) Gauss divergence theorem and Stokes theorems.
September 2022	Electrostatic field: Derivation of field E from potential as gradient, derivation of Laplace and Poisson equation, electric flux, Gauss's law and its application to spherical shell, uniformly charged infinite plane and uniformly charged straight wire, mechanically force of charged surface, Energy per unit volume
October 2022	Magnetostatics: Magnetic Induction, magnetic flux, solenoidal nature of vector field of induction properties of B (i) $\nabla \cdot B = 0$ (ii) $\nabla \times B = \mu_0 J$ Electronic theory of dia and para magnetic (Langevin's theory) Domain theory of ferromagnetism cycle of Magnetization Hysteresis (Energy dissipation, Hysteresis

November
2022

Loss and importance of Physics Course

Electromagnetic theory : Maxwell's equation
and their derivations, Displacement
current, vector and scalar potential,
boundary conditions at interface
between two different
media.

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December
2022

propagation of electromagnetic wave
Basic idea, no derivation (Poynting
vector and Poynting theorem.)

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Manju Kumari

Class: B.Sc II year

Subject: Physics (Computer programming and thermodynamic)

Semester: 3rd.

Months	Topics/Chapters to be Covered
AUGUST 2022	Computer programming: Computer organisation, Binary representation, Algorithm development, flow charts and their interpretation. Fortran Preliminaries, integers and floating point arithmetic expression, built in functions, executable and non-executable statement, input and output statement, formats, IF, DO and GOTO statements, Dimension arrays statements function and function subprogram.
September 2022	Thermodynamics - I Second law of thermodynamics, Carnot theorem, Absolute scale of temperature, Absolute zero, Entropy, show that $dQ/T = 0$, T-s diagram, Nernst Heat law, Joule's free expansion, Joule Thomson (porous) Plug experiment.
October 2022	Joule Thomson effect liquefaction of gases. Air pollution due to internal combustion engine U.P & Revision

November 2022	Thermodynamics - II Derivation of Clausius - Clapeyron latent heat equation. Phase diagram and triple point of a substance. Development of Maxwell thermodynamical relations. Application of Maxwell relations in the derivation of relation between entropy, specific heat and thermodynamical variables.
December 2022	Thermodynamic functions: internal energy (U), Helmholtz function (F), Enthalpy (H), Gibbs function (G) and relation between them. Revision

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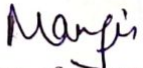
Name of Assistant/Associate Professor: Manju Kumari

Class: B.Sc III Year Subject: Physics (Solid State Physics)

Semester: V

Months	Topics/Chapters to be Covered
AUGUST 2022	Crystalline and glassy forms, liquid crystal, Crystal structure, periodicity, lattice and basis, crystal. translational vectors and axes. Unit cell and primitive cell, Wigner Seitz primitive cell, symmetry operations for a two dimensional crystal, Bravais lattice in two and three dimensions. V.T and Revision.
September 2022	Crystal planes and Miller indices, Interplanar spacing, crystal structures of zinc sulphide, Sodium chloride and diamond, x-ray diffraction, Bragg's law and experimental x-ray diffraction method, K-space. Revision reciprocal lattice and its physical significance, reciprocal lattice vectors, reciprocal lattice to a simple cubic lattice bcc and f.c.c.
October 2022	Specific heat: Specific heat of solid, Einstein theory of specific heat

November 2022	Debye model of specific heat of solids Revision
December 2022	Revision and Tests


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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Ms. MONIKA

Class: B.Sc. Ist Subject: Solid Geometry

Semester: Ist

Months	Topics/Chapters to be Covered
AUGUST 2022	General Equation of second degree. Tracing of Conics. Tangent at any point to the Conic, Chord of Contact, pole of line to the Conic, director Circle of Conic.
September 2022	System of Conics. Confocal Conics. polar Equation of a Conic, tangent and normal to the Conic. Sphere: plane section of a Sphere. Sphere through a given circle. Intersection of two Spheres, radical plane of two spheres. co-axal system of spheres. cones: Right Circular Cone, enveloping Cone and reciprocal Cone.
October 2022	Cylinder: Right Circular cylinder and enveloping cylinder. Central Conicoids: Equation of Tangent plane. Revise Ist Unit + Test

November 2022	Director sphere. Normal to the Conicoids. polar plane of a point. Enveloping cone of a Conicoid. Enveloping cylinder of a Conicoid. Revise I & II unit. Paraboloids: Circular section,
December 2022	Plane Sections of Conicoids. Generating lines. Confocal Conicoid. Reduction of Second degree equations. Test II + III Unit

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Ms. MONIKA

Class: B.Sc IInd Subject: Partial Differential Equations

Semester: IIIrd

Months	Topics/Chapters to be Covered
AUGUST 2022	Partial Differential Equations: Formation, Order and degree, linear and non-linear partial differential equations of the first order: Complete solution, Singular solution, General solution, Solution of Lagrange linear equations, Charpit's general Method of solution.
September 2022	Compatible systems of first order equation Jacobi's Method. linear partial differential equations of second and higher orders, linear and non linear homogeneous and non-homogeneous equations with constant coefficients, partial differential equation with variable coefficients reducible to equations with constant coefficients, their complementary function and particular integrals.
October 2022	Equations reducible to linear equation with constant coefficients. Classification of linear partial differential equations of second degree, Hyperbolic, parabolic and elliptic types, Reduction of second degree linear partial differential equations to canonical forms and their solutions.

November 2022	Solution of Linear Hyperbolic equations, Monge's Method for partial differential equations of second order. Cauchy problem for second order partial differential equations. Characteristic equations and Characteristic curves of second order partial differential equation. Revise I & II unit + test
December 2022	Method of separation of variables. Solution of Laplace's equations, wave equation (one and two dimensions). Diffusion (Heat) equation (one & two dimension) in Cartesian coordinate system.

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November 2022	Chebyshev formula, Gauss Quadrature formula. Numerical Solution of ordinary differential equations: Single step method - Picard's Method. Taylor's Series Method - Euler's Method. Revise unit I & II + Test.
December 2022	Runge - Kutta Methods. Multiple step Methods; Predictor - Corrector Method. Modified Euler's Method, Milne - Simpson's Method. Revise <u>all</u> units + Test.


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Summary of Lesson Plan of College

for Academic Session 2022-23

Name of Assistant/Associate Professor

Dr. Jai Prakash Sharma

Class: B.Sc 1st year

Subject:

Physics - Mechanics

Semester: 1st

Months

AUGUST
2022

Chapter No:- 1 - Basic Concepts of classical Mechanics
Introduction of Mechanics, its type.
Mechanics of single particles.
Mechanics of system of particles.
Conservation laws of linear momentum
Angular momentum and mechanical
energy for a single particle and
no. of particles.

September
2022

Centre of mass and equation of motion
Constrained motion
Degree of freedom
Unit Test - I
Assignment - I

Chapter No:- 2 - Generalised Co-ordinates

Introduction of Generalised Co-ordinates
Generalised Displacement

October
2022

Generalised velocity, acceleration,
momentum, force and potential, Hamilton's
variational principle, Lagrange's eq. of motion
from Hamilton's principle
Linear harmonic oscillator
Simple pendulum
Atwood's Machine.

November
2022

Chapter NO 1-3

Introduction of Rigid body, Rotation of Rigid body, moment of Inertia, torque, angular momentum, Kinetic energy of rotation. Theorems of perpendicular and parallel axes with proof.
Moment of Inertia

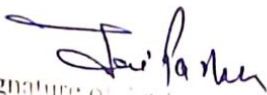
Dynamics of Rigid Bodies

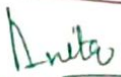
December
2022

Moment of inertia of Solid sphere, hollow sphere, Spherical shell, Solid cylinder, hollow cylinder and Solid bar of rectangular cross-sections
Acceleration of a body rolling down on an inclined plane.

Unit Test - I

Assignment No :- II


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Dr. Jal Parfakh Shazma.
Physics - Optics

Physics - Optics

Physics - Optics



November
2022

Chromatic, Spherical coma, Astigmatism
and distortion aberrations and
their remedies.

Chapter - III — Physical optics.

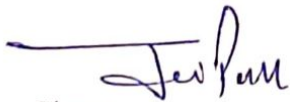
Interference by Division of wavefront
Introduction of Interference.

December
2022

Fresnel's Biprism and its applications for
determination of wavelength of sodium
light and thickness of a mica sheet
Lloyd's Mirror.
Phase change on reflection.

Unit Test

Assignment to
Practical


Signature of A. P. S. Choudhary


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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

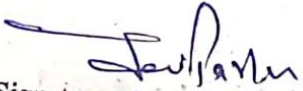
Name of Assistant/Associate Professor: Dr. Tej Paspath Sharma

Class: B.Sc IIIrd 5th Sem Subject: Physics (Quantum Mechanics)

Semester: 5th Sem

Months	Topics/Chapters to be Covered
AUGUST 2022	Introduction of Quantum Mechanics Failure of classical E.M. Theory. Old quantum theory, photon, Photoelectric effect and Einstein's photoelectric equation, Compton effect, its theory and result, Inadequacy of old quantum theory De - Broglie hypothesis.
September 2022	Davisson and Germer experiment, Thomson experiment, Phase velocity, group velocity Heisenberg's uncertainty principle, Time - energy and angular momentum, position (wave-particle duality). Gamma Ray Microscope, Electron diffraction from a slit Unit Test - I Assignment Topic $\rightarrow$ Photoelectric, De-Broglie, Compton Practical - 2 experiment
October 2022	Derivation of time dependent Schrodinger wave equations, eigen values, eigen function, wave functions and its significance Normalization of wave function, concept of observable and operator.

November 2022	Solution of Schrodinger Time dependent and Time independent eq. Solution of Schrodinger equation for harmonic oscillator ground state and excited state.
December 2022	Chapter No. 3 - Applications of Schrodinger wave eq. to one dimensional problems. - Application of Schrodinger equation in the solution of following one-dimensional problems. Free particle in one dimensional box (Solution of Schrodinger wave eq., eigen function, eigen values quantization of energy and momentum, nodes and antinodes, Zero point energy. i) One-dimensional potential barrier (Reflection and Transmission co-efficient. ii) One-dimensional potential barrier (Reflection coefficient, penetration of leakage coefficient penetration depth Assignment - 17 Unit Test-II, Practical


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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Dr. Jai Parkash Sharma

Class: BSc 1st year Subject: Physics (Electronic Devices)

Semester: Second (II Sem)

Months	Topics/Chapters to be Covered
JANUARY 2023	Electromagnetic Induction Growth and decay of current in a circuit with capacitance, resistance, inductance LC, LR, RC, LCR A.C. circuit analysis using complex variable with capacitance, resistance, inductance CR, RL, LC, LCR Series and parallel circuit, Quality factor Unit Test - I + Practical
FEBRUARY 2023	Semiconductor diodes Energy bands in solids, Intrinsic and extrinsic semiconductor, Hall effect, p-n junction and their V-I characteristics, Zener and avalanche breakdown, Resistance of a diode, LED, Photo Conduction in semiconductor photodiode, Solar cell. Rectifier :- P-N junction half wave and full wave rectifier, Types of filter (π) Zener diode, voltage Regulator, power Supply Transistors:-
MARCH 2023	Junction Transistors, Bipolar transistors working of NPN and pnp, (C-B, C-E, C-C mode) constants of transistor, Transistor characteristics curves, advantage of C-B configuration, C.R.O. Unit Test - II Assignment for Physics Unit I and II Practical for Mechanics and electronic.

APRIL
2023

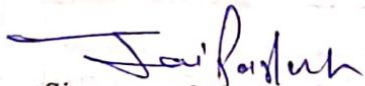
Transistor Amplifiers :-

Transistor biasing, methods of Transistor biasing and stabilization, D.C Load Line, common base and common emitter transistor biasing, common-emitter amplifier, Classification of amplifiers (R-C) coupled amplifiers, feed back in amplifiers, advantage of negative feed back emitter follower.

MAY
2023

Oscillators :-

Oscillators, Principle of Oscillation, Classification of Oscillators, Condition for Self sustained oscillation, Barkhausen Criterion for oscillations, Tuned Collector common emitter oscillator, Hartley oscillator, Colpitt's oscillator
Unit - II
Practical



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Dr. Poojashree Shetty



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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

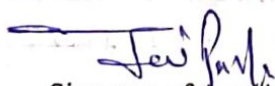
Name of Assistant/Associate Professor: Dr. Jai Prakash Sharma

Class: B.Sc 2nd year Subject: Physics (Optics)

Semester: VI, Phy (402)

Months	Topics/Chapters to be Covered
JANUARY 2023	Interference by Division of Amplitude and Fresnel's Diffraction Introduction of optics. Interference by Division of Amplitude, colour of thin films, wedge shaped film, Newton's rings, Interferometers, Michelson's interferometer and its application, Fresnel's Diffraction, half period zone, Zone plate, diffraction at a straight edge, rectangular slit and circular aperture.
FEBRUARY 2023	Fraunhofer diffraction Introduction of Fraunhofer diffraction, One slit diffraction, Two slit, N-slit diffraction, Plane transmission grating, spectrum, Dispersive power of a grating, Limit of resolution, Rayleigh's criterion, resolving power of telescope and a grating
MARCH 2023	Unit Test for unit I and II, Assignment-I for Interference by and diffraction Practical for optics.

APRIL 2023	<u>Polarization!</u> Introduction of polarization Double Refraction, Polarization by reflection, polarization by scattering Malus law, phenomenon of double refraction, Huygens's wave theory of double refraction, Normal and Oblique incidence. Analysis of Polarised Light + Practical.
MAY 2023	Nical prism, Quarter wave plate and half wave plate Plane polarized light Circularly polarized light Elliptically polarized light Optical activity, Fresnel's theory of rotation, specific rotation, Polarimeter (Half shade and Biquartz) Unit - Test Practical



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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Dr. Jai Prakash Sharm

Class: B.Sc IIIrd year Subject: Physics (Nuclear Physics)

Semester: VI (Sixth Sem)

Months	Topics/Chapters to be Covered
JANUARY 2023	<u>Introduction of Nuclear Physics. The Structure and the properties of Atomic Nucleus.</u> <u>Determination of Nuclear Properties</u> Nuclear Mass, Binding energy, Nuclear size, magnetic dipole moment. Determination of mass by Bain - Bridge method and Jordan mass spectrograph, Mosley Law, Rutherford Back Scattering Unit - Test + Practical
FEBRUARY 2023	<u>(A) Interaction of charged Particles</u> <u>Interaction of heavy charged particles.</u> Alpha particle and its disintegration and its theory, Energy loss of heavy charged particle. Range of Alpha particle, Straggling and Geiger-Nuttall law. <u>Light charged particles (Beta-particles)</u> Beta Spectrum, neutrino hypothesis, its type. Energy loss and its range.
MARCH 2023	<u>Interaction of Gamma Rays with Matter</u> Introduction of Gamma Rays, its Nature, its range and Energies of gamma rays. Gamma radiation through matter. its application Unit Test - , Assignment, Quiz.

APRIL 2023	<u>Nuclear Reaction</u>: Nuclear reaction, scattering types, disintegration of sections Conservation law, Q-Value and section threshold <u>Nuclear Radiation Detectors</u>: Nuclear detector and its type, ionization chamber, proportional counter, GM Unit - Test
MAY 2023	<u>Nuclear Particle Accelerators</u>: Linear accelerator, Tandem Cyclotron and Betatron accelerators <u>Nuclear Fission and Fusion Reactors</u>: Nuclear Reactors General aspects of Reactor design, Nuclear fission and fusion reactors (Principle, construction, working and use) Test, Practical, Assignment

Jai Prakash

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Dr. Jai Prakash Sharma
Deptt of Physics

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: MONIKA

Class: B.Sc Ist

Subject: Number theory & Trigonometry

Semester: IInd

Months	Topics/Chapters to be Covered
JANUARY 2023	Divisibility, G.C.D., L.C.M
	Primes, Fundamental theorem
	of Arithmetic. Linear
	congruences, Fermat's theorem.
	Wilson's theorem and its
	Converse.
FEBRUARY 2023	Linear Diophantine Equations in
	two variables. Complete Residue
	System and Reduced Residue
	System modulo m . Euler's
	function. Euler's Generalization
	of Fermat's theorem. Chinese
MARCH 2023	Remainder theorem. Quadratic
	Residues. Test on 1 st unit
	Legendre Symbols, Lemma of Gauss;
	Gauss Reciprocity Law.
	Greatest Integer function $[x]$
	The number of divisors and
	the sum of divisors of a
	natural number n .
	Mobius function and Mobius
	Inversion formulae.

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

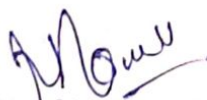
Name of Assistant/Associate Professor: MONIKA

Class: B.Sc IIIrd Subject: Special functions & Integral Transforms

Semester: IVth

Months	Topics/Chapters to be Covered
JANUARY 2023	Series Solution of differential Equation. Power series Method, Definitions of Beta and Gamma functions, Bessel Equation and its Solution. Bessel functions and their properties - Convergence, Recurrence relations and generating functions. Orthogonality of Bessel functions.
FEBRUARY 2023	Legendre and Hermite differential Equations and their Solutions. Legendre and Hermite's functions and their properties, Recurrence relations and generating functions. Orthogonality of Legendre and Hermite polynomials.
MARCH 2023	Rodrigues's formula for Legendre and Hermite polynomials, Laplace Integral Representation of Legendre polynomial. Laplace transforms Existence theorem for Laplace transform. Linearity of the Laplace transforms. Shifting theorems. Test & Unit Revision

APRIL 2023	Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms, Convolution theorem, Inverse Laplace transform, Convolution theorem, Inverse Laplace transforms of derivatives and integrals, Solution of ordinary differential equation using Laplace transform. Test
MAY 2023	Fourier transforms: Linearity property, Shifting, Modulation, Convolution theorem, Fourier transform of derivatives, Relations between Fourier transform and Laplace transform, Parseval's identity for Fourier transforms, Solution of differential equations using Fourier transforms. Revision


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Name of Assistant/Associate Professor: Monika

Class: B.Sc IIIrd

Subject: Linear Algebra

Semester: VIth

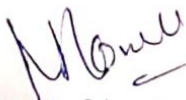
Months	Topics/Chapters to be Covered
JANUARY 2023	Vector spaces, Subspaces, Sum and direct Sum of Subspaces, Linear span, Linearly Independent and dependent Subsets of a vector space. Finitely generated vector space, Existence theorem for basis of a finitely generated vector space.
FEBRUARY 2023	Finite dimensional vector spaces, Invariance of the number of elements of basis sets, Dimensions, Quotient space and its dimension, Homomorphism and Isomorphism of vector spaces, Linear transformations and linear forms on vector spaces, Range & Null space.
MARCH 2023	Vector space of all the linear transformations. Dual spaces, Annihilator of subspaces of finite dimensional vector spaces! Null space, Range space of a linear transformation, Rank and Nullity theorem. Inner product spaces, Cauchy - Schwarz - Inequality, Orthogonal vectors, Orthogonal complements.

APRIL
2023

Orthogonal sets and basis.
Bessel's inequality for finite
dimensional vector spaces,
Gram - Schmidt orthogonalization
process. Adjoint of a linear
transformation and its properties
Unitary linear transformation
Test + II Unit Review

MAY
2023

Algebra of linear transformation
minimal polynomial of a linear
transformation, singular and non
- singular linear transformations,
matrix of a linear transformation,
Change of basis Eigen values and
Eigen vectors of linear
transformation. Test + Revision


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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: MONIKA

Class: B.Com 2nd

Subject: Business Mathematics

Semester: IInd

Topics/Chapters to be Covered

Months

JANUARY
2023

Matrix and Determinants, Definition of a matrix, types of Matrices, Algebra of Matrices, Calculation of values of Determinants up to third order, adjoint of a Matrix, elementary row and column operations, finding Inverse Matrix through adjoint and elementary row and involving three variables

FEBRUARY
2023

Differentiation (only algebraic problem): Application of Differentiation.

Test 1 Unit + Revise 2nd Unit.

MARCH
2023

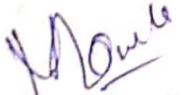
Compound Interest and Annuities. Certain different types of Interest rate. Concept of present value and amount of a sum. Test II Unit + Revise 1st Unit.

APRIL
2023

Type of annuities Present value
And Amount of an
annuity.
including of Continuous
Compounding Test I Unit
+ Third Unit Revise.

MAY
2023

Ratio, Proportion and Percentage
Profit and Loss. Finding inverse
matrix through adjoint and
elementary row or column
operations. Revise I+IV Unit
and 3rd Unit Test


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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Dr. Sunder Singh

Class: B.Sc. 1st Year Subject: English

Semester: 2nd

Months	Topics/Chapters to be Covered
JANUARY 2023	
	Lesson 1: Tolerance
	Translation Week
FEBRUARY 2023	
	Lesson 2: Our Civilization
	Lesson 3: It's Question Time
	Lesson 4: A letter to Children
MARCH 2023	
	Lesson 5: An Interview with Christiaan Barnard
	Lesson 6: Untouchability and the Caste System
	Lesson 7: Recalling Mahadevi

APRIL 2023	Lesson 8: A Talk on Advertising
	Lesson 9: Inhumanisation of Man
	Lesson 10: The End of Imagination
MAY 2023	Lesson 11: Seven Types of Gender Inequality
	Lesson 12: My Last Dollar
	Letter Writing & Precise Writing

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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: Dr. Seetu Singh

Class: B.Sc. 1st Year

Subject: Physical Chemistry

Semester: IInd

Months	Topics/Chapters to be Covered
JANUARY 2023	<u>Kinetics - I -</u> Rate of rxn, rate equation, factors influencing the rate of a rxn, - concentration, temp., Pressure, Solvent, light, Catalyst, Order of a rxn, integrated rate expression for zero order, first order, Second and third order Reaction, Half life period of a rxn, Methods of determination of order of rxn.
FEBRUARY 2023	<u>Kinetics - II -</u> Effect of temperature on the rate of reaction - Arrhenius equation, Theories of reaction rate - Simple collision theory for unimolecular and bimolecular collision, Transition state theory of Bimolecular reaction.
MARCH 2023	<u>Electrochemistry - I -</u> Electrolytic conduction, factors affecting electrolytic conduction, specific conductance, molar conductance, Arrhenius theory of ionization, Ostwald's Dilution Law, Debye - Hückel - Onsager's equation for strong electrolytes.

APRIL
2023

Transport number, definitions and determination by Hittorff's Methods,

Test -

Electrochemistry - II -

Kohlrausch's Law, calculation of molar ionic conductance and effect of viscosity, temp and pressure on it, Application of Kohlrausch's Law in conductivity measurements, determination of degree of dissociation, determination of K_a of acids, determination of solubility product of sparingly soluble salts, Conductometric titration, Definition of pH & pK_a , Buffer Solution, Buffer action, Henderson-Hassel equation, Buffer mechanism of buffer action.

Test.

Satish Singh
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Summary of Lesson Plans of College Faculty for Academic Session 2022-23

Name of Assistant/Associate Professor: SHIVANI

Class: B.Sc. 3rd year Subject: Inorganic Chemistry

Semester: VIth

Months	Topics/Chapters to be Covered
JANUARY 2023	Organometallic Chemistry :- Definition, nomenclature, and classification of organometallic compounds. Preparation properties and bonding of alkyls of Li , Al , Hg and Sn , a brief account of metal-ethylene complexes. mononuclear carbonyls and nature of bonding in metal carbonyls.
FEBRUARY 2023	Acids & bases and HSAB concept :- Arrhenius, Bronsted-Lowry, the Lux-Flood, Solvent system & Lewis's concepts of acids and bases. relative strength of acids and bases. Concept of Hard and Soft acids and Bases. Symbiosis, electronegativity and hardness and softness.
MARCH 2023	Bioinorganic Chemistry :- Essential and trace elements in biological processes metalloporphyrins with special reference to haemoglobin & myoglobin. Biogeochemistry of alkali & alkaline earth metal ions with special reference to Ca^{2+} Nitrogen fixation. Assignment - I.

APRIL 2023	Silicones - preparation, properties, Structure and uses.
	V. Text - I.
MAY 2023	Phosphogenes: - preparation, properties, Structure & uses.

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