GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA
LESSON-PLAN (Session 2023-2024) Even SEMESTER
Name of Professor: Ms. Balwinder Kaur
Designation: Assistant professor
Subject: Chemistry
Class: B.Sc 2nd sem Physical Sciences/Life sciences
Name of the Course: Major Chemistry-II   **Course Code: B23-CHE-201**

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
Feb	**Unit-I:Covalent Bond** Valence bond theory approach, shapes of simple inorganic molecules and ions based on valence shell electron pair repulsion (VSEPR) theory and hybridization with suitable examples of linear, trigonal planar, square planar,tetrahedral, trigonal bipyramidal and octahedral arrangements. Molecular orbital theory of homonuclear (N_2, O_2) and heteronuclear (CO and NO) diatomic molecules, dipole moment and percentage ionic character in covalent bond. **Ionic Solids** Ionic structures (NaCl, CsCl, ZnS (Zinc blende), CaF_2) size effects, radius ratio rule and its limitations, Concept of Lattice energy, Born- Haber cycle, Solvation energy and its relationship with solubility of Ionic solids, Polarizing power and Polarisability of ions, Fajan's rule.	After completing this course, the learner will be able to: Able to understand the theories which governs the shape, structure and ionic behavior, polarizability, ionic structures and concept of Lattice energy of crystals of molecules.	Group learning and teaching& Problem based learning, Interactive learning	
March	**Unit-II:** **Chemical Kinetics** Concept of reaction rates, rate equation, factors influencing the rate of reaction, Order and molecularity of a reaction, integrated rate expression for zero, first, Half-life period of a reaction, Arrhenius equation. **Distribution Law** Nernst distribution law – its thermodynamic derivation, Nernst distribution law after association and dissociation of solute in one of the phases, of	To know the basics of rates of chemical reactions ,the laws and solubility behaviour of solutes in different compositions of solvents	Group learning and teaching& Demonstration by Practicals, Problem based learning, Interactive learning	**Assignment I** **AND Class Test**

	distribution law: (i)Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride			
Apr il	**Unit-III:Alkanes and Cycloalkanes** Nomenclature, classification of carbon atoms in alkanes and its structure. Isomerism in alkanes, sources. Methods of formation: Wurtz reaction, Kolbe reaction, Corey- House reaction and decarboxylation of carboxylic acids, physical properties. Mechanism of free radical halogenation of alkanes: reactivity and selectivity. Nomenclature of Cycloalkanes, Baeyer' s strain theory and its limitations, theory of strainless rings. **Alkenes** Nomenclature of alkenes and its structure.Methods of formation: dehydration of alcohols, dehydrohalogenation of alkyl halide, Hofmann elimination and their mechanism. The Saytzeff rule and relative stabilities of alkenes. Chemical reactions: electrophilic and free radical additions, addition of halogens, halogen acids, hydroboration–oxidation, oxymercuration-reduction, ozonolysis and hydration. Markownikof's rule of addition.	To know about alkanes, alkene, cycloalkanes and their chemical reactions.	Group learning and teaching Problem based learning, Interactive learning	**Ass ign me nt II and Tes t**
Ma y	**Unit-IV:Hydrogen Bonding and Van der Waals forces** Hydrogen Bonding – Definition, types, effects of hydrogen bonding on properties of substances, application Brief discussion of various types of Van der Waals forces. **Metallic Bond and semiconductors** Metallic bond – Qualitative idea of valence bond and Band theories of metallic bond (conductors, semiconductors, insulators). Semiconductors – Introduction, types, and applications.	To understand about weak interactions and bonding in metals	Group learning and teaching, Interactive learning	**Rev isio n and Tes ts**

GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA
LESSON-PLAN (Session 2023-2024) Even SEMESTER
Name of Professor: **Ms. Balwinder Kaur**
Designation: **Assistant professor**
Subject: **Chemistry**
Class: **B.Sc 2nd sem Physical Sciences**
Name of the Course: **Minor Chemistry-II**   **Course Code: B23-CHE-203**

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
FEB	**UNIT-I:** **Periodic table and atomic properties** **Atomic properties:** atomic and ionic radii, ionisation energy, electron affinity and electronegativity definition, methods of determination or evaluation, trend in periodic table, effective nuclear charge, Slater's rules	After completing this course, the learner will be able to: Able to understand the the basics of periodic properties and hybridization.. .	Self Study & Group learning and teaching	
MAR	**UNIT-II:** **Ionic Solids:** Stoichiometric and Non-stoichiometric defects in crystals, Lattice energy and Born- Haber cycle, Solvation energy and its relationship with solubility of Ionic solids, Polarizing power and Polarisability of ions, Fajan's rule.	To learn about the ionic solids.	Group learning and teaching& Practical based learning., Interactive learning	**Assign ment -1 Test**
APR	**UNIT-III:** **Structure and Bonding in Organic Compounds** Localized and delocalized chemic al bond, Van der Waal's interactions, resonance: conditions, resonance effect and its applications, hyperconjugation, inductive effect, Electromeric effect & their comparison	Learner will understand the concept of structure and Bonding in Organic Compounds	Group learning and teaching Practical based learning, Interactive learning	**Assign ment -2 Tests**
MAY	**Gaseous States:** Kinetic Molecular Theory of Gases, Calculation of root mean square velocity, average velocity and most probable velocity. Collision diameter, collision number, collision frequency and mean free path (Derivations excluded)	Students will understand the basics of Gaeous States	Group learning and teaching, Practical based learning, Interactive learning	**REVISIO N AND TESTS**

GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA

LESSON-PLAN (Session 2024-25) EVEN SEMESTER

Name of Teacher: **Ranjeet Singh**

Designation: Professor in Physics

Class: B Sc 1st Semester, Physical Sciences

Subject/ Paper: Electricity Magnetism and EM Theory
Type of course(Major/Core): Major, B23-PHY-201

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	Feb 2025	**Vector Background and Electric Field** : Gradient of a scalar and its physical significance, Line, Surface and Volume integrals of a vector and their physical significance, Flux of a vector field, Divergence and curl of a vector and their physical significance, Gauss's divergence theorem, Stoke's theorem. Conservative nature of Electrostatic Field, Electrostatic Potential, Potential as line integral of field, potential difference Derivation of electric field E from potential as gradient. Derivation of Laplace and Poisson equations. Electric flux, Gauss's Law, Differential form of Gauss's law and applications of Gauss's law. Mechanical force of charged surface, Energy per unit volume.	Group Learning and Teaching Learning trough problem solving Project based learning PPT based and Lectures from Youtube	After completing this course, the learner will be able to Explain and differentiate the vector and scalar formalisms of electrostatics. Also be able to apply Gauss's Divergence & Stokes theorem to solve various problems in electrostatics	

2.	March 2025	**Magnetic Field**: Biot-Savart law and its simple applications: straight wire and circular loop, Current Loop as a Magnetic Dipole and its Dipole Moment, Ampere's Circuital Law and its applications to (1) Solenoid and (2) Toroid, properties of B: curl and divergence**,** **Magnetic Properties of Matter**: Force on a dipole in an external field, Electric currents in Atoms, Electron spin and Magnetic moment, types of magnetic materials, Magnetization vector (M), Magnetic Intensity (H), Magnetic Susceptibility and permeability, Relation between B, H and M, Electronic theory of dia and paramagnetism, Domain theory of ferromagnetism (Langevin's theory), Cycle of Magnetization-B-H curve and hysteresis loop: Energy dissipation, Hysteresis loss and importance of Hysteresis Curve	Group Learning and Teaching Learning trough problem solving Project based learning PPT based and Lectures from Youtube	After completing this topic, the learner will be able to Describe the magnetic materials & important properties of magnetic field. Understand the properties and theories of dia-, para- & ferromagnetic materials.	
3.	April 2025	**Time varying electromagnetic fields**: Electromagnetic induction, 11 34(578) Faraday's laws of induction and Lenz's Law, Self-inductance, Mutual inductance, Energy stored in a Magnetic field, Derivation of Maxwell's equations, Displacement current, Maxwell's equations in differential and integral form and their physical significance. **Electromagnetic Waves:** Electromagnetic waves, Transverse nature of electromagnetic wave, energy transported by electromagnetic waves, Poynting vector, Poynting's theorem. Propagation of Plane electromagnetic waves in free space & Dielectrics	Group Learning and Teaching Learning trough problem solving Project based learning PPT based and Lectures from Youtube	After completing this topic, the learner will be able to Derive Maxwell equations and their physical significance and familiar about the propagation of electromagnetic waves i.e. boundary conditions at the interface between different media. The students will also be able to have basic idea about the propagation of electromagnetic waves in free space and in medium.	

| 4. | May 2025 | **DC current Circuits**: Electric current and current density, Electrical conductivity and Ohm's law (Review), Kirchhoff's laws for D.C. networks, Network theorems: Thevenin's theorem, Norton theorem, Superposition theorem. **Alternating Current Circuits**: A resonance circuit, Phasor, Complex Reactance and Impedance, Analysis for RL, RC and LC Circuits, Series LCR Circuit: (1) Resonance, (2) Power Dissipation (3) Quality Factor and (4) Band Width, Parallel LCR Circuit. | Group Learning and Teaching Learning trough problem solving Project based learning PPT based and Lectures from Youtube | After completing this topic, the learner will be able to: Understand D.C. and A.C. circuits, able to apply and analyse using networks. Analyze DC/AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor. | |

❖ **Seminar/Presentation/Assignment/Quiz/Class Test /Mid-Term Exam will be taken as per schedule.**

Signature of Teacher   **Principal**

Name of Teacher: **Ranjeet Singh**

Designation: Professor in Physics

Class: B Sc 1st Semester, Life Sciences

Subject/ Paper: **Elementary Electricity, Magnetism & EM Theory**
Type of course(Major/Core): Minor, B23-PHY-202

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	Feb 2025	**Vector background and electric field**: Gradient of a scalar and its physical significance, Line, Surface and Volume integrals of a vector and their physical significance, Flux of a vector field, Divergence and curl of a vector and their physical significance, Gauss's divergence theorem, Stoke's theorem.	Group Learning and Teaching Learning trough problem solving Project based learning PPT based and Lectures from Youtube	After completing this course, the learner will be able to Explain and differentiate the vector and scalar formalisms of electrostatics. Also be able to apply Gauss's Divergence & Stokes theorem to solve various problems in electrostatics	

2.	March 2025	**Magnetic field and magnetic properties** : Magnetic induction, Magnetic flux, Solenoidal nature of vector field of induction, properties of B (i) $\nabla.B = 0$ (ii) $\nabla \times B = \mu oJ$, Magnetic Materials, types, Hysteresis curve and importance of Hysteresis Curve.	Group Learning and Teaching Learning trough problem solving Project based learning PPT based and Lectures from Youtube	After completing this topic, the learner will be able to Describe the magnetic materials & important properties of magnetic field. Understand the properties and theories of dia-, para- & ferromagnetic materials	
3.	April 2025	**Time varying electromagnetic fields and electromagnetic waves** : Electromagnetic induction, Faraday's laws of induction and Lenz's Law, Derivation of Maxwell's equations and their physical significance. Boundary conditions at interface between two different media, Propagation of electromagnetic wave (Basic idea, no derivation), Poynting vector and Poynting theorem.	Group Learning and Teaching Learning trough problem solving Project based learning PPT based and Lectures from Youtube	After completing this topic, the learner will be able to Derive Maxwell equations and their physical significance and familiar boundary conditions at the interface between different media. The students will also be able to have basic idea about the propagation of electromagnetic waves	
4.	May 2025	**D.C. and A.C. circuits**: D.C. Network theorems: Thevenin's theorem, Norton theorem, Superposition theorem; Analysis of LCR Series and parallel resonant circuits.	Group Learning and Teaching Learning trough problem solving Project based learning PPT based and Lectures from Youtube	After completing this topic, the learner will be able to: Analyze DC/AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor.	

❖ **Seminar/Presentation/Assignment/Quiz/Class Test /Mid-Term Exam will be taken as per schedule.**

Signature of Teacher   **Principal**

GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA

LESSON-PLAN (Session 2024-25) EVEN SEMESTER

Name of Teacher: Pooja Girotra

Designation: Extension Lecturer

Class: B.A/B.Sc. IInd Sem

Subject/ Paper: Algebra and Number Theory

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	February	Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices, Elementary operations on matrices, Rank of a matrix, Inverse of a matrix, Linear dependence and independence of rows and columns of matrix, Row rank and column rank of a matrix, Eigen values, Eigen vectors and characteristic equation of a matrix, Minimal polynomial of a matrix, Cayley-Hamilton theorem and its use in finding the inverse of a matrix, Unitary and orthogonal matrices.	1. **Learning through Problem Solving** 2. **Group-Learning & Teaching**	Gain knowledge of the concepts of symmetric, skew-symmetric, Hermitian, skew-Hermitian, Orthogonal and Unitary matrices, Linear dependence and independence of rows and columns of a matrix. Have knowledge of procedure and cognitive skills used in calculating rank of a matrix, eigen values, characteristic equation, minimal polynomial of a matrix and technical skills used in solving problems based on Cayley-Hamilton theorem.	
2.	March	Relations between the roots and coefficients of general polynomial equation in one variable, Solutions of polynomial equations having conditions on roots, Common roots and multiple roots, Transformation of equations, Nature of the roots of an equation, Descarte's rule of signs.	1. **Learning through Problem Solving** 2. **Group-Learning & Teaching**	Have knowledge of the concepts used in solving problems based on relations between the roots and coefficients of general polynomial equation 34(971) CLO 5 is related to the practical component of the course. in one variable, solutions of polynomial equations having conditions on roots, common roots and multiple roots. Understand Descarte's rule of signs and learn cognitive and technical	

				skills required in assessing nature of the roots of an equation and solving problems based on these.	
3.	**April**	Solutions of cubic equations (Cardon's method), Biquadratic equations and their solutions. Divisibility, Greatest common divisor (gcd), Least common multiple (lcm), Prime numbers, Fundamental theorem of arithmetic.	1. **Learning through Problem Solving** 2. **Group-Learning & Teaching**	Have deeper and procedural knowledge required for solving cubic and biquadratic equations used in Mathematics as well as many other learning fields of study. To understand the basic concepts of number theory and their applications in problem solving and life- long learning.	
4.	**May**	Linear congruences, Fermat's theorem, Euler's theorem, Wilson's theorem and its converse, Chinese Remainder theorem, Linear Diophantine equations in two variables.	1. **Learning through Problem Solving** 2. **Group-Learning & Teaching**	Have knowledge of concepts, facts, principles and theories of Linear Congruences, Fermat's theorem, Euler's theorem, Wilson's theorem and its converse, Chinese Remainder theorem. Attain cognitive skills used in solving linear Diophantine equations in two variables.	

❖ **Seminar/Presentation/Assignment/Quiz/Class Test /Mid-Term Exam will be taken as per schedule.**

Signature of Teacher   **Principal**

GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA

LESSON-PLAN (Session 2024-25) EVEN SEMESTER

Name of Teacher: Dr. Neetu

Designation: Assistant Professor in Botany

Class: B.Sc. I (Life Science) 2nd Sem

Subject/ Paper: Botany (Plant Taxonomy and Ecology)

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	February	Botanical nomenclature and major rules of ICBN and ICN; Keys to identification of plants. General introduction and importance of herbaria and botanical gardens. Documentation of Floristic Diversity: Brief idea about floras, monographs and journals. Brief idea of taxonomic evidences, Types of inflorescence, flower and parts of flower. Artificial, natural and phylogenetic classifications. Bentham and Hooker system of classification (upto series), Angiosperm Phylogeny Group-	Interactive Lectures and Discussions, Group learning and teaching, Peer Teaching, Visual aids (Microscopic images, charts and Diagrams).	Students will gain knowledge about taxonomy, including the rules of nomenclature and other essential aspects. Students will acquire a conceptual understanding of angiosperm classification systems and the diversity of families within them.	Submission of Assignment 1+ Test

		general account.			
2.	**March**	Diagnostic features and economic importance of the following families: Ranunculaceae, Brassicaceae, Malvaceae, Euphorbiaceae, Rutaceae, Leguminosae, Apocynaceae, Lamiaceae, Solanaceae, Asteraceae, Poaceae and Orchidaceae. **Ecology:** Definition; scope and importance; levels of organization. Environmental factors- climatic factors, edaphic factors, topographic; and Biotic factors. **Population Ecology:** Basic concept; characteristics; biotic potential, growth curves; ecotypes and ecads.	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams). Group learning and teaching.	Students will gain the knowledge of diagnostic features, morphology and economic importance of some important families. Students will gain knowledge about Ecology and Environmental interactions.	Submission of Assignment 2+Test
3.	**April**	**Community Ecology:** Concepts; characteristics (qualitative and quantitative-analytical and synthetic); methods of analysis; ecological succession. **Ecosystem:** Structure and functions (trophic levels, food chains, food webs, ecological pyramids and energy flow). Phyto-geography: Phyto-geographical	Interactive Lectures and Discussions, Group learning and teaching.	Students will acquire a conceptual understanding of community ecology, ecosystem structure, environmental pollution.	Mid term Exam as Per Schedule

		regions of India; vegetation types of India (forests).			
4.	**May**	**Global Change:** Greenhouse effect and greenhouse gases; impacts of global warming; carbon trading. **Biodiversity:** levels, types, significance, threats and conservation.	Interactive Lectures and Discussions, Learning through Problem Solving, Group learning and teaching.	Students will gain the knowledge about the ecological concepts and biodiversity indices.	Power Point Presentations and Revision

❖ **Seminar/Presentation/Assignment/Quiz/Class Test /Mid-Term Exam will be taken as per schedule.**

       Signature of Teacher   **Principal**

GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA

LESSON-PLAN (Session 2024-25) EVEN SEMESTER

Name of Teacher: SUJATA RANI

Designation: Assistant Professor of Zoology

Class: B.Sc. I

Subject/ Paper:

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Re mar ks
1.	FEB	➢ Amphibia: General Characters and Classification upto orders; Origin, Evolutionary tree. ➢ Type study of frog (Rana tigrina), Parental Care and Neoteny in Amphibia	**1)Lectures:** Supported by power point presentations and related videos **2)Assignments and exercises 3)Test:** Knowledge of the students is tested through surprise tests, quiz & session tests **4) Class room Discussions 5) Practical work related to the topics 5) Seminars**	Students will be able to understand: ➢ evolutionary lines of vertebrate class including amphibians, reptiles, birds, and mammals. ➢ Students will be able to identify (based on morphological characters) ➢ Adaptations in vertebrate class including amphibians, reptiles, birds, and mammals.	
2.	March	➢ Reptilia: General Characters and Classification upto orders ➢ Type study of Lizard (Hemidactylus) ➢ Origin, Evolutionary tree. Extinct reptiles; Poisonous and non-poisonous snakes;			

		Poison apparatus in snakes			
3.	**April**	➢ Aves: General Characters and Classifications upto orders. ➢ Type study of Pigeon (Columba livia); ➢ Aerial adaptation, Principles of aerodynamics in Bird flight ➢ Migration in birds.			
4.	**May**	➢ **Mammals: General Characters and classification up to orders** ➢ **Type study of Rat** ➢ **Adaptive radiations of mammals,** ➢ **Dentition.** ➢ **Affinities of Prototheria, metatheria & eutheria**			

			3	

- ❖ **Seminar/Presentation/Assignment/Quiz/Class Test /Mid-Term Exam will be taken as per schedule.**

Signature of Teacher   **Principal**