

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

LESSON-PLAN (Session 2026-2027) ODD SEMESTER

Name of Professor: Mrs. Balwinder Kaur
Designation: Assistant Professor
Subject: Chemistry
Course code: B23-CHE 501
Class: B.Sc 5th sem (Phy Sci & Life science)

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
August	Coordination compounds: Werner's theory of coordination compounds , EAN chelates , nomenclature of coordination compounds Metal- Ligand Bonding in Transition Metal complexes: valence bond theory application and limitations An elementary idea of crystal field theory, crystal field splitting in octahedral complexes Tetrahedral and square planer complexes Magnetic properties of Transition metal complexes: Types of magnetic materials, magnetic susceptibility, method of determining magnetic susceptibility, spin only formula, basic idea of LS coupling L-S coupling, Thermodynamics II third law of thermodynamics , Nernst heat theorem Residual entropy, Evaluation absolute entropy, Evaluation absolute entropy from heat capacity data. Gibbs function and Helmholtz function as thermodynamics quantities. Criteria for thermodynamics equilibrium and spontaneity. Variation of G with P,V and T, Partial molar quantities Concept of chemical potential	To understand about the basis of Coordination compounds To understand about thermodynamics and equilibrium in predicting various physical properties of system	Group Learning and Teaching	Assignment -1 Test

Sept	Phase Equilibrium Statement and meaning of the terms – phase, component and degree of freedom, thermodynamic derivation of Gibbs phase rule, phase equilibria of one component system – Example – water system. Phase equilibria of two component systems solid-liquid equilibria, simple eutectic Example Pb-Ag system,. Quantum Mechanics-I Black-body radiation, Plank's radiation law, postulates of quantum mechanics, quantum mechanical operators, commutation relations, Hamiltonian operator, Hermitian operator. Average value of square of Hermitian as a positive quantity, Role of operators in quantum mechanics, Determination of wave function & energy of a particle in one dimensional box. Rotational Spectrum Selection rules, Energy levels of rigid rotator (semi-classical principles), rotational spectra of diatomic molecules, spectral intensity distribution using population distribution (Maxwell-Boltzmann distribution), determination of bond length and isotopic effect	To Get knowledge about the Quantum mechanical properties and analysis of diatomic molecules	PPT presentation & learning through problem solving	Assignment -2 Test
Oct	Organic Synthesis via Enolates: Acidity of hydrogens, alkylation of diethyl malonate and ethylacetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate. Heterocyclic Compounds: Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution.	To understand about synthesis and mechanism of some organic reactions and heterocyclic compounds	Group Learning and Teaching	Revision and Tests
Nov	Mechanism of nucleophilic substitution reactions in pyridine derivatives. Comparison of basicity of pyridine, piperidine and pyrrole Revision and Tests			

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

LESSON-PLAN (Session 2026-2027) ODD SEMESTER

Name of Professor: Mrs BALWINDER KAUR
Designation: Assistant Professor
Class: B.Sc. Ist Semester (MAJOR IN CHEMISTRY)
Subject: PHYSICAL CHEMISTRY-I
course code: B23-CHE-102

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
August	Chemical Kinetics: Kinetics Rate of reaction, rate equation and its types, factors influencing the rate of a reaction – concentration, temperature, pressure, solvent, light, catalyst. Order and molecularity of a reaction, integrated rate expression for zero order, integrated rate expression for first order, second and third order reactions (for equal and unequal concentrations of reactants), methods of determination of order of reaction, Half-life period of a reaction. Effect of temperature on the rate of reaction – Arrhenius equation. Theories of reaction rate – Simple collision theory for unimolecular collision. Transition state theory of bimolecular reactions.	The student will Get the knowledge of concepts of rates of chemical reactions and its application in determination of order of various reactions.	Group Learning and Teaching	
SEPTEMBER	Thermodynamics: Definition of thermodynamic terms: system, surrounding etc. Types of systems, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Thermodynamic equilibrium, Concept of heat and work. First law of thermodynamics: statement, concepts of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule–Thomson coefficient for ideal gas and real gas and inversion temperature. Calculation of w , q , dU & dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process.	The student will Get the knowledge of various thermodynamic variables and properties.	Group Learning and Teaching	Assignment -1 and Test
OCTOBER	Physical Properties and Molecular Structure-I: Optical activity, polarization – (Clausius – Mossottiequation derivation excluded). Orientation	The student will learn about the concepts of physical and	PPT presentation & and	Assignment -2 Test

	of dipoles in an electric field, dipole moment, induced dipole moment. Measurement of dipole moment-temperature method and refractivity method, dipole moment and structure of molecules, Magnetic permeability, magnetic susceptibility and its determination.	thermodynamic functions in different reversible reactions and get the knowledge of molecular structure.		
NO V	Physical Properties and Molecular Structure-II: Application of magnetic susceptibility, magnetic properties – paramagnetism, diamagnetism and ferromagnetism. Revision and Tests	The student will learn and understand about the various properties of molecules related to its magnetic behaviour	Group Learning and Teaching	

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

LESSON-PLAN (Session 2026-27) ODD SEMESTER

Name of Teacher: Kanchan Bala

Designation: Associate Professor

Class: BSC 5th sem

Subject/ Paper: Sequences and Series

Type of course (major/ minor/ VAC/ AEC/SEC/ MDC): Major

S No	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students
1.	August	Boundedness of the set of real numbers, Least upper bound and Greatest lower bound of a set. Archimedean, algebraic and ordered properties in $\mathbb{R}$. The real number system as a complete ordered field. Neighbourhoods, interior points, isolated points, limit points, Open sets, closed sets, interior of a set, closure of a set in real numbers and their properties. Bolzano-Weierstrass theorem. Open covers, compact sets and Heine-Borel theorem.	Group learning and teaching, learning through problem solving	Understand basic concepts of real number system, set theory and preliminary results on neighbourhood of a point, interior and limit points, open sets, closed sets etc.

2.	September	Denumerable and non-denumerable sets, Denumerability of integers, rationals and non-denumerability of real numbers. Sequences: Real sequences and their convergence, Theorems on limit of sequence, Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence, Subsequences and subsequential limits, Limit superior and limit inferior.	. Learn about denumerability of subsets of real numbers, sequences, their limits, boundedness and convergence. Determine the convergence and divergence of a sequence. Understand Cauchy sequence and Cauchy general principle of convergence of sequence.
3.	October	Infinite series: Convergence and divergence of Infinite Series, Comparison tests of positive terms infinite series, Cauchy's general principle of Convergence of series, Convergence and divergence of geometric series, Hyper Harmonic series or pseries, D-Alembert's ratio test, Raabe's test, Logarithmic test, Cauchy's nth root test, De-Morgan and Bertrand's test, Gauss Test, Cauchy's integral test, Cauchy's condensation test.	Attain skills to determine convergence of a series of real numbers by applying various tests.

4.	November	Alternating series, Absolute and conditional convergence, Leibnitz test. Arbitrary series, Abel's and Dirichlet's test, Insertion and removal of parenthesis, Re-arrangement of terms in a series, Riemann's re-arrangement theorem and Pringsheim's theorem, Cauchy product of series.		To know absolute and conditional convergence of alternating series and apply theory to check the convergence of arbitrary series.
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❖ 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 2026-27) ODD SEMESTER

Name of Teacher: Kanchan Bala

Designation: Associate Professor

Class: BSC 5th sem

Subject/ Paper: Sequences and Series

Type of course (major/ minor/ VAC/ AEC/SEC/ MDC): Major

S No	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students
1.	August	Boundedness of the set of real numbers, Least upper bound and Greatest lower bound of a set. Archimedean, algebraic and ordered properties in $\mathbb{R}$. The real number system as a complete ordered field. Neighbourhoods, interior points, isolated points, limit points, Open sets, closed sets, interior of a set, closure of a set in real numbers and their properties. Bolzano-Weierstrass theorem. Open covers, compact sets and Heine-Borel theorem.	Group learning and teaching, learning through problem solving	Understand basic concepts of real number system, set theory and preliminary results on neighbourhood of a point, interior and limit points, open sets, closed sets etc.

2.	September	Denumerable and non-denumerable sets, Denumerability of integers, rationals and non-denumerability of real numbers. Sequences: Real sequences and their convergence, Theorems on limit of sequence, Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence, Subsequences and subsequential limits, Limit superior and limit inferior.	. Learn about denumerability of subsets of real numbers, sequences, their limits, boundedness and convergence. Determine the convergence and divergence of a sequence. Understand Cauchy sequence and Cauchy general principle of convergence of sequence.
3.	October	Infinite series: Convergence and divergence of Infinite Series, Comparison tests of positive terms infinite series, Cauchy's general principle of Convergence of series, Convergence and divergence of geometric series, Hyper Harmonic series or pseries, D-Alembert's ratio test, Raabe's test, Logarithmic test, Cauchy's nth root test, De-Morgan and Bertrand's test, Gauss Test, Cauchy's integral test, Cauchy's condensation test.	Attain skills to determine convergence of a series of real numbers by applying various tests.

4.	November	Alternating series, Absolute and conditional convergence, Leibnitz test. Arbitrary series, Abel's and Dirichlet's test, Insertion and removal of parenthesis, Re-arrangement of terms in a series, Riemann's re-arrangement theorem and Pringsheim's theorem, Cauchy product of series.		To know absolute and conditional convergence of alternating series and apply theory to check the convergence of arbitrary series.
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❖ 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 2026-2027) ODD SEMESTER

Name of Professor: Dr. Saroj Bala

Designation: Assistant Professor

Class: B.Sc. 1st Semester (Life Science)

Subject: Diversity of Microbes, Algae, Fungi and Archegoniates

course code: B23-BOT-101

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
August	Bacteria: Structure, nutrition, reproduction and economic importance. Viruses: General account of Viruse including structure of TMV and Bacteriophages. Algae: General characters, Introductory classification; economic importance; and life cycle (excluding development) of <i>Nostoc</i> (Cyanophyceae), <i>Volvox</i> , (Chlorophyceae), <i>Vaucheria</i> (Xanthophyceae), <i>Ectocarpus</i> (Phaeophyceae) and <i>Polysiphonia</i> (Rhodophyceae). Fungi: General characters, Introductory classification; economic importance; and life-history of <i>Phytophthora</i> (Mastigomycotina), <i>Penicillium</i> (Ascomycotina), <i>Puccinia</i> (Basidiomycotina), <i>Colletotrichum</i> (Deuteromycotina).	Students will learn about the algae, virus, fungi and bacteria with economic importance.	Group Learning and Teaching	
September	General account of Lichens , types, ecological and economic importance. Bryophyta: Bryophytes: General characteristics, classification upto classes (Smith, 1935), alternation of generations, structure and reproduction (excluding development) of <i>Marchantia</i> (Hepaticopsida), <i>Anthoceros</i> (Anthocerotopsida), <i>Funaria</i> (Bryopsida), ecological and economic importance of bryophytes.	Students will learn about the bryophytes, lichens with their economic importance	Group Learning and Teaching	Assignment -1 and Test
Sept	Pteridophyta: General characters, classification upto classes (A. R. Smith, 2006), structure and reproduction (excluding development) of	Students will understand about different types of pteridophytes.	PPT presentation	Assignment -2 Test

	Rhynia (Psilopsida): Structure and reproduction (excluding development) of Selaginella (Lycopsida), Equisetum (Sphenopsida) and Pteris (Pteropsida). heterospory and seed habit, stelar evolution; Ecological and economic importance.			
Oct	Gymnosperms: General characteristics, classification up to classes (Smith 1955), morphology, anatomy and reproduction of <i>Cycas</i>, <i>Pinus</i>, <i>Ephedra</i> (developmental details not to be included); Distribution and economic importance; General account of paleobotany and Geological time scale.	The students will learn and understand the fundamental properties of gymnosperms.	Group Learning and Teaching	
Nov	Revision and Tests			

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

LESSON-PLAN (Session 2026-2027) ODD SEMESTER

Name of Professor: Dr. Saroj Bala
Designation: Assistant Professor
Class: B.Sc. 1st Semester (Life Science)
Subject: Organic Farming
course code: B23-BOT-109

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
August	Basics of organic farming – Concept and components of organic farming, aims and objectives; Need of organic farming; Historical development of organic farming in India; Status of organic farming in India; Advantages and disadvantages of organic farming. Organic farming process- Concept of farming system, Developing organic farms, Important steps & methods; Pure organic farming and integrated farming system (combination of organic and inorganic).	1. To get more knowledge on the organic farming	Teaching learning Strategy and group Discussion	
Sept	Plant nutrients: Essential plant nutrients, their role in plant growth and development, Nutrient uptake and utilization by plant. Nutrient management in organic farming: Balanced nutrients supply for organic farming system using nutrients from organic sources. Preparation, nutrient content and methods of use of following- FYM/Rural compost, mulching, city compost, oil cakes, animal wastes, vermicomposts, vermiwash, jeevamrit, beejamrit, green manures, biofertilizers.	2.To learn about different plant nutrition	Group Learning and Teaching	Assignment - 1 and Test
Sept	Bio fertilizers and their method of use – Nitrogenous, Phosphatic, Potassic, availability of nutrients from above sources. Recycling of organic matter in organic agriculture- Transformation of organic substances in soil. Disease and pest management in organic farming-Integrated pest & disease managements; Organic pesticides, bio-pesticides; Inorganic pesticides, disadvantages of their use;Seed, seedling and soil treatment measures; Feasibility of complete dependence on organic sources. Weed management inorganic farming	3.To know the importance of biofertilizers, disease management.		

Oct	Use of Neem and other plant products in organic farming; Organic agri horticulture in urban & semi urban areas. Certification, Standardization, Marketing - Quality control and certification procedures of organic products. Organic standards In India. Govt. schemes related to organic farming in India. Potential demand and Marketing of organic products. Organic farming and food security in India.	4. To learn about plant products in organic farming	Ppt presentation	Assignment - 2 Test
Nov	Revision and Tests			Revision and Tests

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

LESSON-PLAN (Session 2026-2027) ODD SEMESTER

Name of Professor: Dr. Saroj Bala
Designation: Assistant Professor
Class: B.Sc. 1st Semester (Life Science)
Subject: Fundamentals of Botany
course code: B23-BOT-104

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
Aug	General characteristics, morphology and economic importance of viruses, bacteria algae, fungi and lichens.	Students will learn about the viruses, bacteria algae, fungi and lichens.	Group Learning and Teaching	
Sept	General characteristics, morphology and economic importance of Bryophytes and Pteridophytes. General characteristics, morphology and economic importance Gymnosperms.	Students will learn about Bryophytes and Pteridophytes	Group Learning and Teaching	Assignment -1 and Test
Oct	General characteristics, morphology and economic importance of Angiosperms.	Students will learn about Angiosperms	PPT presentation & and	Assignment -2 Test
Nov	Revision and Tests			

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

LESSON-PLAN (Session 2026-2027) ODD SEMESTER

Name of Professor: Dr. Saroj Bala

Designation: Assistant Professor

Class: B.Sc. 1st Semester (Life Science)

Subject: Diversity of Microbes, Algae, Fungi and Archegoniates

course code: B23-BOT-101

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
August	Bacteria: Structure, nutrition, reproduction and economic importance. Viruses: General account of Viruse including structure of TMV and Bacteriophages. Algae: General characters, Introductory classification; economic importance; and life cycle (excluding development) of <i>Nostoc</i> (Cyanophyceae), <i>Volvox</i> , (Chlorophyceae), <i>Vaucheria</i> (Xanthophyceae), <i>Ectocarpus</i> (Phaeophyceae) and <i>Polysiphonia</i> (Rhodophyceae). Fungi: General characters, Introductory classification; economic importance; and life-history of <i>Phytophthora</i> (Mastigomycotina), <i>Penicillium</i> (Ascomycotina), <i>Puccinia</i> (Basidiomycotina), <i>Colletotrichum</i> (Deuteromycotina).	Students will learn about the algae, virus, fungi and bacteria with economic importance.	Group Learning and Teaching	
September	General account of Lichens , types, ecological and economic importance. Bryophyta: Bryophytes: General characteristics, classification upto classes (Smith, 1935), alternation of generations, structure and reproduction (excluding development) of <i>Marchantia</i> (Hepaticopsida), <i>Anthoceros</i> (Anthocerotopsida), <i>Funaria</i> (Bryopsida), ecological and economic importance of bryophytes.	Students will learn about the bryophytes, lichens with their economic importance	Group Learning and Teaching	Assignment -1 and Test
Sept	Pteridophyta: General characters, classification upto classes (A. R. Smith, 2006), structure and reproduction (excluding development) of	Students will understand about different types of pteridophytes.	PPT presentation	Assignment -2 Test

	Rhynia (Psilopsida): Structure and reproduction (excluding development) of Selaginella (Lycopsida), Equisetum (Sphenopsida) and Pteris (Pteropsida). heterospory and seed habit, stelar evolution; Ecological and economic importance.			
Oct	Gymnosperms: General characteristics, classification up to classes (Smith 1955), morphology, anatomy and reproduction of <i>Cycas</i>, <i>Pinus</i>, <i>Ephedra</i> (developmental details not to be included); Distribution and economic importance; General account of paleobotany and Geological time scale.	The students will learn and understand the fundamental properties of gymnosperms.	Group Learning and Teaching	
Nov	Revision and Tests			

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

LESSON-PLAN (Session 2026-2027) ODD SEMESTER

Name of Professor: Dr. Saroj Bala
Designation: Assistant Professor
Class: B.Sc. 1st Semester (Life Science)
Subject: Organic Farming
course code: B23-BOT-109

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
August	Basics of organic farming – Concept and components of organic farming, aims and objectives; Need of organic farming; Historical development of organic farming in India; Status of organic farming in India; Advantages and disadvantages of organic farming. Organic farming process- Concept of farming system, Developing organic farms, Important steps & methods; Pure organic farming and integrated farming system (combination of organic and inorganic).	1. To get more knowledge on the organic farming	Teaching learning Strategy and group Discussion	
Sept	Plant nutrients: Essential plant nutrients, their role in plant growth and development, Nutrient uptake and utilization by plant. Nutrient management in organic farming: Balanced nutrients supply for organic farming system using nutrients from organic sources. Preparation, nutrient content and methods of use of following- FYM/Rural compost, mulching, city compost, oil cakes, animal wastes, vermicomposts, vermiwash, jeevamrit, beejamrit, green manures, biofertilizers.	2.To learn about different plant nutrition	Group Learning and Teaching	Assignment - 1 and Test
Sept	Bio fertilizers and their method of use – Nitrogenous, Phosphatic, Potassic, availability of nutrients from above sources. Recycling of organic matter in organic agriculture- Transformation of organic substances in soil. Disease and pest management in organic farming-Integrated pest & disease managements; Organic pesticides, bio-pesticides; Inorganic pesticides, disadvantages of their use;Seed, seedling and soil treatment measures; Feasibility of complete dependence on organic sources. Weed management inorganic farming	3.To know the importance of biofertilizers, disease management.		

Oct	Use of Neem and other plant products in organic farming; Organic agri horticulture in urban & semi urban areas. Certification, Standardization, Marketing - Quality control and certification procedures of organic products. Organic standards In India. Govt. schemes related to organic farming in India. Potential demand and Marketing of organic products. Organic farming and food security in India.	4. To learn about plant products in organic farming	Ppt presentation	Assignment - 2 Test
Nov	Revision and Tests			Revision and Tests

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

LESSON-PLAN (Session 2026-2027) ODD SEMESTER

Name of Professor: Dr. Saroj Bala
Designation: Assistant Professor
Class: B.Sc. 1st Semester (Life Science)
Subject: Fundamentals of Botany
course code: B23-BOT-104

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
Aug	General characteristics, morphology and economic importance of viruses, bacteria algae, fungi and lichens.	Students will learn about the viruses, bacteria algae, fungi and lichens.	Group Learning and Teaching	
Sept	General characteristics, morphology and economic importance of Bryophytes and Pteridophytes. General characteristics, morphology and economic importance Gymnosperms.	Students will learn about Bryophytes and Pteridophytes	Group Learning and Teaching	Assignment -1 and Test
Oct	General characteristics, morphology and economic importance of Angiosperms.	Students will learn about Angiosperms	PPT presentation & and	Assignment -2 Test
Nov	Revision and Tests			

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

LESSON-PLAN (Session 2026-2027) odd SEMESTER

Name of Professor: Dr.Rani jindal
Designation: Assistant Professor
Name of the Course: Analytical Chemistry
Course Code: B23-SEC-221
Class: B.Sc IstSem (Phy and life science)

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
August	Chromatography: Definition, general introduction on principles of chromatography, Column chromatography, paper chromatography, TLC & , ion-exchange chromatography.	Enables student to separate, identification and purification of the components of mixture for qualitative and quantitative analysis	Group learning and teaching & Practical based learning	
September	Analysis of soil: Composition of soil, Concept of pH and pH measurement, Complexometric titrations, Chelation, Chelating agents, use of indicators. Analysis of water: Definition of pure water, sources responsible for contaminating water,	Student will learn about water, its contamination and water purification , methods	Group learning and teaching & Practical based learning	Assignment -1 Test
October	Analysis of food products: Nutritional value of foods, idea about food processing and food preservations and adulteration. Revision	Student learn about food nutrients, its preservation and adulteration	Group learning and teaching & Practical based learning	Assignment -2 Tests
November	REVISION			

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

LESSON-PLAN (Session 2026-2027) odd SEMESTER

Name of Professor: Dr. Rani Jindal

Designation: Assistant Professor Class:

B.Sc 5th sem

Subject: Chemistry of Fertilizers and Pesticides **Theory course code B23-CHE-303**

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
August	Tips to get best efficiency of Applied fertilizers, Integrated nutrient management, fertilizers and its relations to plant nutrients, Factors effecting optimum fertilizer dose.	the learner will be able to: 1. Know about fertilizers and nutrients;	Group Learning and Teaching	
Sept	Classification and types of fertilizers, Nitrogenous fertilizers: Ammonium nitrate, Urea, Calcium Cyanamide, Calcium Ammonium Nitrate, Sodium Nitrate, Ammonium Chloride: Introduction, Raw materials, Action of as a fertilizers Phosphate fertilizers: Normal super phosphate, Triple Super Phosphate, Ammonium Phosphate. Potassic fertilizers (Types and optimum doses)	Understand types of nitrate fertilizers; Understand types of phosphate fertilizers	Group Learning and Teaching	Assignment -1 and Test
Oct	pesticides: Classification, synthesis, structure activity relationship (SAR), mode of action, uses and adverse effects of representative pesticides in the following classes: Organochlorines (DDT, Gammaxene); Organophosphates (Malathion, Parathion); Carbamates (Carbofuran and Carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor).	Get the knowledge about pesticides	PPT presentation & and	Assignment -2 Test
Nov	Revision and Tests			

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

LESSON-PLAN (Session 2026-2027) ODD SEMESTER

Name of Professor: Dr. Rani jindal

Subject:

Chemistry

Designation: Assistant professor

Class: B.Sc 1ST sem Physical and Life Sciences

Course Code: B23-CHE-101

M o n t h s	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Rem arks if any
A U G U S T	Atomic Structure Dual behaviour of matter and radiation, de Broglie's relation, Heisenberg's uncertainty principle, concept of atomic orbital's, significance of quantum numbers	1. Enable to understand the basis of quantum mechanics and structural idea and relevance in describing shapes of s, p and d orbitals.	Group Learning and Teaching, Discussion	
S E P T E M B E R	Radial and angular wave functions, normal and orthogonal wave functions, significance of Ψ and Ψ^2 , shapes of s, p, d, f orbitals, Rules for filling electrons in various orbitals, effective nuclear charge, Slater's rules. Periodic table and atomic properties Classification of periodic table, definition of atomic and ionic radii, ionisation energy, electron affinity and electro negativity, trend in periodic table (in s and p-block elements), Pauling, Mullikan, Allred Rachow and Milliken Jaffe's electronegativity scale, Sanderson's electron density ratio Gaseous State Kinetic theory of gases, Maxwell's distribution of velocities and energies (derivation excluded) Calculation of root mean square velocity, average velocity, and most probable velocity.	2. To learn about role of temperature and pressure to establish the state of gases and describe the concept of critical constants of real gases.	Group Learning and Teaching	Assi gnm ent - 1 Test
O C T O B E R	Collision diameter, collision number, collision frequency and mean free path (Derivations excluded), Deviation of Real gases from ideal behaviour, Derivation of Vander Waal's Equation of State, its application in the calculation of Boyle's temperature. Critical Phenomenon Concept of Critical temperature, critical pressure, critical volume, relationship between critical constants and Vander Waal's constants (Derivation excluded). III Structure and Bonding Localized and delocalized chemical bond Vander Waals interactions. Concept of resonance and its applications, hyperconjugation, inductive effect, Electrometric effect and their comparison. Mechanism of Organic Reactions Curved arrow notation, haemolytic and heterotypic bond fission. Types of reagents: electrophiles and nucleophiles. Types of organic reactions: Substitution, Addition, Condensation, Elimination, Rearrangement, Isomerization and Pericyclic reactions.	3. Get knowledge about the electrophile/nucleophile and its role in mechanism of preparation of organic compounds.	PPT presentation	Assi gnm ent - 2 Test s

N O V	Reactive intermediates: Carbocations, carbanions, free radicals, carbenes (structure & stability) Liquid State Structure of liquids, Properties of liquids – surface tension, refractive index, viscosity, vapour pressure and optical rotation. Solid State Classification of solids, Law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry and symmetry elements, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of Laue method, rotating crystal method and powder pattern method Revision and test	4. To know the physical properties, morphology and crystalline study of liquid and different type of solids.	Group Learning and Teaching	RE VIS ION
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GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA

LESSON-PLAN (Session 2026-2027) ODD SEMESTER

Name of Professor: Dr. Rani Jindal
Designation: Assistant Professor
Subject: Chemistry(MDC chemistry) Theory course code B23-CHE-303
Class: B.Sc 3rd sem

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
August	Pollution and their types:	1 To get more knowledge on the impacts of pollution on environment	Teaching learning Strategy and group Discussion	
Sept	Plastic and polyethene pollution, pollution sources, Recycling of plastic, greenhouse effect, ozone depletion II Energy: Energy sources, renewable and non-renewable sources, cells and batteries, fuel cell, solar cell, polymer cell :	2.To learn about different energy resources	Group Learning and Teaching	Assignment - 1 and Test
Oct	Water Sources of drinking water and uses, water conservation, Permissible TDS, Techniques of purification of water, R.O. water purification process (Osmosis and Reverse Osmosis), wastewater management Pesticides and Herbicides: General introduction and definition, biological control and chemical control: natural and synthetic pesticides, benefits and adverse effects of DDT, BHC, malathion	3.To know the importance of pure water 4 To learn about Pesticides and their bad impacts on health	PPT presentation	Assignment - 2 Test
Nov	Revision and Tests	To Know more about Pesticides and their bad impacts on health	Group Learning and Teaching	Revision and Tests

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

LESSON-PLAN (Session 2026-2027) ODD SEMESTER

Name of Professor: Dr. Rani Jindal
Designation: Assistant Professor
Subject: Chemistry(FOOD SAFETY AND HEALTH) Theory B23-VAC-329
Class: B.Sc 3rd sem B. Sc major in chemistry

Months	Topics to be covered	Learning outcomes of the student	Teaching learning Strategy	Remarks if any
August	Introduction to food safety: Characterization of food hazards. Bacteria, types and characteristics. Factor influencing multiplication of bacteria. Introduction to Cross contamination: Transmission & routes of cross contamination & control, prevention of cross contamination.	After completing this course, the learner will be able to: 1. Impart comprehensive knowledge on the issues of food safety and health	Teaching learning Strategy and group Discussion	
Sept	Introduction to Food Storage, stock rotation. Cold holding (storage temperature, temperature variation & temperature monitoring) Temperature control and measurement. Introduction to preparation of food: Food processing (Ingredient preparation, ingredient processing, product holding) Waste disposal & cleaning	2. Knowledge of various food storage methods & food production system. 3. Build technical proficiency in undertaking auditing in food safety and quality assurance in food processing chain i.e., from farm to fork.	Group Learning and Teaching	Assignment - 1 and Test
Oct	Cook chill, cook freeze and defrosting. Methods of defrosting. Food preparation areas design: Cleaning & disinfection (basic principles, planned cleaning, cleaning schedule) Introduction to HACCP. Personal hygiene for food handlers, staff illness. Training in personal hygiene. Protective clothing	4. Impart knowledge of HACCP, cleanness and hygiene	PPT presentation	Assignment - 2 Test
Nov	Revision and Tests			