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

LESSON-PLAN (Session 2024-25) EVENSEMESTER

Name of Teacher: Kiran Bala

Designation: Assistant Professor

Class: B.Sc II (Sem. IV) (B23-MAT-401)

Subject/ Paper: Analytical Geometry & Vector Calculus

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	February	General equation of second degree: Classification of conic sections; centre, asymptotes, axes, eccentricity, foci and directrices of conics. Tangent at any point to a conic, chord of contact, pole of line to a conic, director circle of a conic. Polar equation of a conic, tangent and normal to a conic, confocal conics.	Group- Learning and Teaching	Gain knowledge of the concept of different conic sections, their classification and properties. Understand various terms related to conic sections and gain skills to use them in problem solving.	
2.	March	Sphere: General form, Plane section of a sphere. Sphere through a given circle. Intersection of two spheres, tangent plane and line, polar plane and line, orthogonal spheres, radical plane of two spheres and co-axal system of spheres. Cone: Equation of a cone, right circular cone, quadric cone, enveloping cone. Tangent plane and condition of tangency.	Group- Learning and Teaching	Have knowledge of general form of equation of a sphere and attain procedural knowledge required for solving problems related to intersection of spheres, tangent plane and line, orthogonality, length of tangent and co-axial system of spheres. Learn about equations of cones and apply knowledge for problem solving.	
3.	April	Cylinder: Right circular cylinder and enveloping cylinder. Central Conicoids: Equation of tangent plane. Director sphere. Normal to the conicoids. Polar plane of a point. Enveloping cone of a conicoid, Enveloping cylinder of a conicoid, confocal conicoid,	Group- Learning and Teaching	Have deeper knowledge and understanding of cylinder, enveloping cylinder, concepts of conicoids, tangent plane, director sphere, normal, envelope and to make further use thereof.	

		reduction of second degree equations.			
4.	**May**	Scalar and Vector product of three vectors, four vectors, reciprocal vectors, vector differentiation and derivative along a curve, directional derivatives; Gradient of a scalar point function, divergence and curl of vector point functions, their geometrical meanings and vector identities. Vector integration: line integral, surface integral and volume integral. Theorem of Gauss, Green, Stoke and problems based on these.	**Group- Learning and Teaching**	Understand and solve problems related to scalar and vector product of vectors, vector differentiation, directional derivatives, gradient, divergence and curl operators. Have deeper understanding of line, surface and volume integrals, their evaluation, proof of Gauss Divergence, Green's and Stoke's theorems and gain theoretical and technical knowledge in computing different surface flux integrals, volume integrals and line integrals used in other disciplines also.	

- **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

Name of Professor: **Dr. Rani Jindal**
Designation: **Assistant Professor**
Subject: **Chemistry**
Class **BSc IVth (Phy & Life Science)** **Course code** B23-CHE-401

Months	**Topics to be covered**	**Learning outcomes of the student**	**Teaching learning Strategy**	Remarks if any
Feb	**Chemistry of d-Block elements** Definition of transition elements, General characteristic properties of d-Block elements, Comparison of ionic radii 3d, 4d and 5d series elements, magnetic properties, Stability of various oxidation states and Latimer and Frost diagrams, Structure of some compounds of transition elements- TiO_2, $VOCl_2$, $FeCl_3$, $CuCl_2$ and $Ni(CO)_4$. Chemistry of f-Block elements Lanthanide contraction, oxidation states, magnetic properties, complex formation, colour and ionic radii. Actinides: General characteristics of actinides, Transuranic elements, comparison of properties of Lanthanides and actinides with transition elements. **Theory of Qualitative and Quantitative Analysis** Chemistry of analysis of various groups of basic and acidic radicals, chemistry of identification of acid radicals in typical combination, common ion effect,	After completing this course, the learner will be able to: 1. Classify d block and f block elements and also know their properties _	Group learning and teaching	
March	solubility product, theory of precipitation, co-precipitation, post precipitation, purification of precipitates. **Thermodynamics-I 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. Second law of thermodynamics, Carnot cycles and its efficiency, Concept of entropy, entropy as a function of V & T, entropy as a function of P & T. Chemical Equilibrium Concept of Equilibrium constant, Temperature dependence of equilibrium constant, Clausius–Clapeyron equation and its applications.	2. Learn about the basic idea of analysis with respect to qualitative as well as quantitative measures	Group learning and teaching & Learning through problem solving	Assignment -1 Test
April	**Alcohols** Monohyric alcohols: nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids, and esters. Hydrogen bonding, Acidic nature, Reactions of alcohols. Phenols Nomenclature, structure, and bonding. Preparation: Cumene hydroperoxide method, from diazonium salts, physical properties, and acidic character. Chemical Reactions: — electrophilic aromatic substitution, Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction, Kolbe's reaction. **Aldehydes and Ketones** Nomenclature and structure of the carbonyl group. Preparation: oxidation of alcohols, from acid chlorides and from nitriles, Comparison of reactivities of aldehydes and ketones.	3. Know about the first and second law of thermodynamics and also their implications and also know about the concept of chemical equilibrium	Group learning and teaching & Learning through problem solving	Assignment -2 Test
May	Mechanism of nucleophilic additions to carbonyl group: benzoin, aldol, Perkin and Knoevenagel condensations. Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction, Baeyer–Villiger oxidation of ketones, Cannizzaro reaction, MPV, Clemmensen and WolffKishner reductions	4. Know about the alcohols, phenols, aldehydes and ketones with respect to their general characteristics reactions	Group learning and teaching & Learning through problem solving	Revision and Tests

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

Name of Professor: **Dr. Rani Jindal**
Designation: **Assistant Professor**
Subject: **Chemistry**
Class **BSc IVth (Phy & Life Science)** **Course code** B23-CHE-401

Months	**Topics to be covered**	**Learning outcomes of the student**	**Teaching learning Strategy**	Remarks if any
Feb	**Chemistry of d-Block elements** Definition of transition elements, General characteristic properties of d-Block elements, Comparison of ionic radii 3d, 4d and 5d series elements, magnetic properties, Stability of various oxidation states and Latimer and Frost diagrams, Structure of some compounds of transition elements- TiO_2, $VOCl_2$, $FeCl_3$, $CuCl_2$ and $Ni(CO)_4$. Chemistry of f-Block elements Lanthanide contraction, oxidation states, magnetic properties, complex formation, colour and ionic radii. Actinides: General characteristics of actinides, Transuranic elements, comparison of properties of Lanthanides and actinides with transition elements. **Theory of Qualitative and Quantitative Analysis** Chemistry of analysis of various groups of basic and acidic radicals, chemistry of identification of acid radicals in typical combination, common ion effect,	After completing this course, the learner will be able to: 1. Classify d block and f block elements and also know their properties _	Group learning and teaching	
March	solubility product, theory of precipitation, co-precipitation, post precipitation, purification of precipitates. **Thermodynamics-I 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. Second law of thermodynamics, Carnot cycles and its efficiency, Concept of entropy, entropy as a function of V & T, entropy as a function of P & T. Chemical Equilibrium Concept of Equilibrium constant, Temperature dependence of equilibrium constant, Clausius–Clapeyron equation and its applications.	2. Learn about the basic idea of analysis with respect to qualitative as well as quantitative measures	Group learning and teaching & Learning through problem solving	Assignment -1 Test
April	**Alcohols** Monohyric alcohols: nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids, and esters. Hydrogen bonding, Acidic nature, Reactions of alcohols. Phenols Nomenclature, structure, and bonding. Preparation: Cumene hydroperoxide method, from diazonium salts, physical properties, and acidic character. Chemical Reactions: — electrophilic aromatic substitution, Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction, Kolbe's reaction. **Aldehydes and Ketones** Nomenclature and structure of the carbonyl group. Preparation: oxidation of alcohols, from acid chlorides and from nitriles, Comparison of reactivities of aldehydes and ketones.	3. Know about the first and second law of thermodynamics and also their implications and also know about the concept of chemical equilibrium	Group learning and teaching & Learning through problem solving	Assignment -2 Test
May	Mechanism of nucleophilic additions to carbonyl group: benzoin, aldol, Perkin and Knoevenagel condensations. Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction, Baeyer–Villiger oxidation of ketones, Cannizzaro reaction, MPV, Clemmensen and WolffKishner reductions	4. Know about the alcohols, phenols, aldehydes and ketones with respect to their general characteristics reactions	Group learning and teaching & Learning through problem solving	Revision and Tests

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

LESSON-PLAN (Session 2024-25) EVEN SEMESTER

Name of Teacher: Tara Jayant

Designation: Associate Professor

Class: B.Sc. II Life Sciences (4th semester)

Subject/ Paper: Genetics (Paper: Molecular Genetics)

Type of Course: Genetics Major (B23-GEN-401)

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	February 2025	Introduction to syllabus, books and examination pattern for theory and practical. Genetic Material: Identification evidence, chemical nature, structure of DNA and RNA, different forms of DNA. Transposable elements: Types, Mechanisms of their transposition, Prokaryotic and eukaryotic transposons.	Power Point Presentation & individual learning	Students will have basic understanding of genetic material and transposons.	
2.	March 2025	DNA Replication: Models of DNA replication, replication origins, DNA replication in prokaryotes and eukaryotes. DNA repair mechanism: Mismatch, Direct, Base-Excision and Nucleotide-Excision repair.	Power Point Presentation & Video demonstration	Students will acquire knowledge about the basics of DNA replication and different repair mechanisms.	**Class test will be taken**
3.	April 2025	Transcription: Initiation, elongation and termination in prokaryotes and eukaryotes, Translation: Initiation, elongation and termination in prokaryotes and eukaryotes.	Power Point Presentation & Video demonstration	Students will have understanding of basic concepts of transcription and translation.	**Assignment will be given**
4.	May 2025	Regulation of gene expression in prokaryotes: Operon concept and structure, lac operon, trp operon and their regulation. Regulation of gene expression in eukaryotes: Transcriptional level and post-transcriptional level.	Power Point Presentation by teacher and students.	Students will acquire knowledge about gene regulation in prokaryotes and eukaryotes.	**Mid Term Exam & Revision of complete syllabus**
5.	June 2025	**UNIVERSITY EXAMS**			

- **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: Tara Jayant

Designation: Associate Professor

Class: B.Sc. II Life Sciences (4th semester)

Subject/ Paper: Zoology (Paper: Biomolecules and Mammalian Physiology)

Type of Course: Zoology Major (B23-ZOO-401)

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	February 2025	Introduction to syllabus, books and examination pattern for theory and practical. Introduction, classification, structure, function and general properties of proteins, carbohydrates and lipids. Nomenclature, classification and mechanisms of enzyme action; Enzyme Kinetics, factors affecting enzyme activity, inhibition of enzymes Transport through bio membranes (Active and Passive), osmotic pressure, hydrogen ion concentration and buffers.	Power Point Presentation and Video Demonstration	Students will be able to understand the nature and composition of biomolecules and mechanisms of transport across cell membrane.	
2.	March 2025	Nutrition: Nutritional components: Carbohydrates, fats, lipids, Vitamins and Minerals; Types of nutrition & feeding, Digestion of lipids, proteins, carbohydrates & nucleic acids; symbiotic digestion, lactose intolerance, Physico-chemical mechanism of Absorption of nutrients & assimilation; control of secretion of digestive juices. Muscles: Types of muscles, ultra-structure of skeletal muscle, neuromuscular junction. Bio-chemical and physical events during muscle contraction, single muscle twitch, tetanus, muscle fatigue,	Power Point Presentation, Video Demonstration and individual learning	Students will be able to understand the mechanism of nutrition and muscle contraction.	**Class test will be taken**

		muscle tone, oxygen debt., Cori's cycle, single unit smooth muscles, their physical and functional properties.			
3.	**April 2025**	Circulation: Origin, conduction and regulation of heart beat; cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system; Composition and functions of blood & lymph; Mechanism of coagulation of blood, coagulation factors; anticoagulants, haemopoiesis. Respiration: Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of haemoglobin, Bohr's effect, Hamburger's phenomenon (Chloride shift), control / regulation of respiration (peripheral reflexes, chemical control and Higher centres), Myoglobin. Excretion: Patterns of excretory products viz. Amonotelic, ureotlic uricotelic, ornithine cycle (Kreb's – Henseleit cycle) for urea formation in liver; Urine formation, composition of Urine, counter-current mechanism of urine formation, osmoregulation, micturition.	Power Point Presentation by teacher and students.	Students will be able to explain the mechanism of circulation, respiration and excretion in animals.	**Assignment will be given**
4.	**May 2025**	Neural Integration: Nature, origin and propagation of nerve impulse along with medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse, synaptic delay and synaptic fatigue, Neurotransmitter. Chemical integration of Endocrinology: Structure, chemical nature and mechanism of peptide and steroid hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid,	Power Point Presentation by teacher and students.	Students will be able to explain the role of hormones in control and coordination and physiology of animal reproduction.	**Mid Term Exam & Revision of complete syllabus**

		adrenal, pancreas and gonads, Hormonal disorders. Reproduction: Spermatogenesis, Capacitation of spermatozoa, oogenesis, ovulation, formation of corpus luteum, oestrous-anoestrous cycle, Menstrual cycle in human, fertilization, implantation and gestation, parturition.			
5.	**June 2025**	**UNIVERSITY EXAMS**			

- **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: Tara Jayant

Designation: Associate Professor

Class: B.Sc. II Life Sciences (4th semester)

Subject/ Paper: Zoology (Paper: Biomolecules and Mammalian Physiology)

Type of Course: Zoology Major (B23-ZOO-401)

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	February 2025	Introduction to syllabus, books and examination pattern for theory and practical. Introduction, classification, structure, function and general properties of proteins, carbohydrates and lipids. Nomenclature, classification and mechanisms of enzyme action; Enzyme Kinetics, factors affecting enzyme activity, inhibition of enzymes Transport through bio membranes (Active and Passive), osmotic pressure, hydrogen ion concentration and buffers.	Power Point Presentation and Video Demonstration	Students will be able to understand the nature and composition of biomolecules and mechanisms of transport across cell membrane.	
2.	March 2025	Nutrition: Nutritional components: Carbohydrates, fats, lipids, Vitamins and Minerals; Types of nutrition & feeding, Digestion of lipids, proteins, carbohydrates & nucleic acids; symbiotic digestion, lactose intolerance, Physico-chemical mechanism of Absorption of nutrients & assimilation; control of secretion of digestive juices. Muscles: Types of muscles, ultra-structure of skeletal muscle, neuromuscular junction. Bio-chemical and physical events during muscle contraction, single muscle twitch, tetanus, muscle fatigue,	Power Point Presentation, Video Demonstration and individual learning	Students will be able to understand the mechanism of nutrition and muscle contraction.	**Class test will be taken**

		muscle tone, oxygen debt., Cori's cycle, single unit smooth muscles, their physical and functional properties.			
3.	**April 2025**	Circulation: Origin, conduction and regulation of heart beat; cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system; Composition and functions of blood & lymph; Mechanism of coagulation of blood, coagulation factors; anticoagulants, haemopoiesis. Respiration: Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of haemoglobin, Bohr's effect, Hamburger's phenomenon (Chloride shift), control / regulation of respiration (peripheral reflexes, chemical control and Higher centres), Myoglobin. Excretion: Patterns of excretory products viz. Amonotelic, ureotlic uricotelic, ornithine cycle (Kreb's – Henseleit cycle) for urea formation in liver; Urine formation, composition of Urine, counter-current mechanism of urine formation, osmoregulation, micturition.	Power Point Presentation by teacher and students.	Students will be able to explain the mechanism of circulation, respiration and excretion in animals.	**Assignment will be given**
4.	**May 2025**	Neural Integration: Nature, origin and propagation of nerve impulse along with medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse, synaptic delay and synaptic fatigue, Neurotransmitter. Chemical integration of Endocrinology: Structure, chemical nature and mechanism of peptide and steroid hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid,	Power Point Presentation by teacher and students.	Students will be able to explain the role of hormones in control and coordination and physiology of animal reproduction.	**Mid Term Exam & Revision of complete syllabus**

		adrenal, pancreas and gonads, Hormonal disorders. Reproduction: Spermatogenesis, Capacitation of spermatozoa, oogenesis, ovulation, formation of corpus luteum, oestrous-anoestrous cycle, Menstrual cycle in human, fertilization, implantation and gestation, parturition.			
5.	**June 2025**	**UNIVERSITY EXAMS**			

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

Signature of Teacher **Principal**

Lesson Plan for BSc (Physics Science)

Class :- BSc 2nd year

Sem:-IV

Subject :- Wave and Optics

Teacher :- Aman Kumar

Month	Syllabus Covered	Outcome
January	INTERFERENCE: Young's double slit experiment, Coherence, Conditions of interference, Fresnel's biprism, applications.	Understand the principle of interference, coherence conditions, and practical applications of Fresnel's biprism.
February	INTERFERENCE: Plane parallel thin film, production of colors, Newton's rings, Interference due to transmitted and reflected light.	Analyze thin film interference, Newton's rings experiment, and interference in transmitted and reflected light.
March	DIFFRACTION: Fresnel's diffraction theory, Rectilinear propagation, Diffraction at a straight edge, rectangular slit, and circular aperture.	Understand diffraction patterns and their dependence on the aperture shape, along with Fresnel's theory.
April	DIFFRACTION: Fraunhofer diffraction – single slit, double slit, plane transmission grating spectrum, resolving power of telescope.	Analyze Fraunhofer diffraction and apply the concept of resolving power to optical instruments.

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. II (Life Science) 4th Sem

Subject/ Paper: Botany (Cytology and Genetics)

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	**February**	Cell as a unit of Life; The Cell Theory; Prokaryotic and eukaryotic cells; Eukaryotic Cell components Structure and functions of Cell Wall, Plasma Membrane, nucleus, Nuclear Envelope- structure of nuclear pore complex, Golgi Apparatus, Ribosome, Endoplasmic Reticulum, Chloroplast, Mitochondria, Lysosomes, Peroxisomes and Vacuoles.	Interactive Lectures and Discussions, Group learning and teaching, Visual aids (Charts, Models and Diagrams).	Students will understand the fundamental characteristics of cells.	Submission of Assignment 1+ Test
2.	**March**	Cell Division: Mitosis and Meiosis. Chromosome: structural organization, ultrastructure of Centromere and Telomere, lampbrush and polytene chromosomes. DNA: structure, types	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts,	Students will acquire comprehensive knowledge about cell division and the central	Submission of Assignment 2+ Test

		and replication. RNA: structure and types. Genetic code.	Models and Diagrams). Group learning and teaching.	dogma of molecular biology.	
3.	**April**	Mendel's laws of Inheritance. Lethal Genes; Codominance, incomplete dominance; Gene interaction (inter- and intra-allelic); Multiple allelism; Pleiotropism. Chi Square test; Pedigree Analysis. Cytoplasmic Inheritance: Kappa particles in Paramecium, leaf variegation in Mirabilis jalapa, Shell coiling.Complete &incomplete linkage, recombination frequency, crossing over.	Interactive Lectures and Discussions, Problem Solving, Group learning and teaching.	Students will learn about the principles of inheritance in biology	Mid Term Exams as per Schedule
4.	**May**	Chromosomal aberrations- deletions, duplications, translocations, inversions; Variations in chromosome number- aneuploidy, polyploidy; sex chromosomes and sex determination. Types of mutations, effects of physical & chemical mutagens.	Interactive Lectures and Discussions, Learning through Group learning and teaching.	Students will develop a thorough understanding of mutations, chromosomal aberrations, and the concept of linkage.	Revision

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

Signature of Teacher **Principal**