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

LESSON-PLAN (Session 2025-26) ODD SEMESTER

Name of Teacher: Dr. Neetu
Designation: Assistant Professor in Botany
Class: B.Sc. II Life Sciences
Subject/ Paper: Plant Physiology
Type of course(major/ minor/ VAC/ AEC/SEC/ MDC): Major

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	**July**	Plant water relations: absorption, water potential and transpiration.	Interactive Lectures and Discussions, Visual aids (charts and Diagrams), Theoretical Foundations and Practical Experiments.	Students will acquire an understanding of various physiological process in plants.	Class Test
2.	**August**	Role of micro and macro nutrients. Photosynthesis, Respiration. Biosynthesis, mechanism of action and uses of auxin, gibberellin.	Interactive Lectures and Discussions, Visual aids (charts and Diagrams), Theoretical Foundations and Practical Experiments, Group Discussions and Presentations.	Students will develop a comprehensive knowledge of Photosynthesis, Respiration and plant hormones.	Unit Test-1/Submission of Assignment 1
3.	**September**	Biosynthesis, mechanism of action and uses of cytokinin, abscisic acid, ethylene, Lipid metabolism and Nitrogen metabolism. Structure, function and mechanisms of action of phytochromes; stomatal movement; photoperiodism and biological clocks.	Interactive Lectures and Discussions, Visual aids (charts and Diagrams), Theoretical Foundations and Practical Experiments, Group Discussions and Presentations.	Students will develop a comprehensive knowledge of plant hormones. Students will learn about Phytochromes, photomorphogenesis, photoperiodism and its	Class Test/ Power Point Presentations (Mid-term Exams as per Schedule)

				significance.	
4.	**October**	Mechanism of flowering. Concepts of plant growth; factors affecting germination and dormancy of seeds;	Interactive Lectures and Discussions, Visual aids (charts and Diagrams), Theoretical Foundations and Practical Experiments, Group Discussions and Presentations.	Students will gain a conceptual understanding of flowering, germination and dormancy of seeds.	Unit Test-2/ Submission of Assignment 2
5.	**November**	Physiological and biochemical changes associated with senescence and abscission. Revision.	Interactive Lectures and Discussions, Visual aids (charts and Diagrams), Theoretical Foundations and Practical Experiments, Group Discussions and Presentations.	Students will gain a conceptual understanding of plant growth and senescence, including the natural aging process of plants.	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 2025-26) ODD SEMESTER

Name of Teacher: Dr. Neetu
Designation: Assistant Professor in Botany
Class: B.Sc. III Life Sciences
Subject/ Paper: Economic Botany and Plant Biotechnology
Type of course(major/ minor/ VAC/ AEC/SEC/ MDC): Major

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	**July**	**Food Plants:** Introduction to Cereals and Millets; Origin, distribution, botanical description, brief idea of cultivation and uses of Rice, Wheat and Maize.	Interactive Lectures and Discussions, Visual aids (charts and Diagrams), Group discussions, Theoretical Foundations and Practical Experiments.	Students will acquire an understanding on origin, distribution, cultivation and uses of cereals.	Class Test
2.	**August**	**Protein Crops (Pulses):** Origin, distribution, botanical description, brief idea of cultivation and uses of Gram, Arhar, Peas. **Introduction to Vegetables:** Origin, distribution, botanical description, brief idea of cultivation and uses of Potato, Tomato, Onion. **Fibers:** Introduction to natural fibers; Origin, distribution, botanical description, brief idea of cultivation, processing and uses of Cotton, Jute and Flax. **Oil Yielding Crops:** Origin, distribution, botanical description, brief idea of cultivation and uses of Groundnut, Mustard and Coconut.	Interactive Lectures and Discussions, Visual aids (charts and Diagrams), Theoretical Foundations, Practical Experiments and Group Discussions.	Students will develop a comprehensive knowledge on origin, distribution, cultivation and uses of millets, pulses, fibres and oil yielding crops.	Unit Test-1/Submission of Assignment 1

3.	**September**	**Spices and Condiments:** Introduction to spices and condiments; Morphology of plant part used, brief idea of cultivation and uses of Coriander, Black Pepper, Ginger, Turmeric and Cloves. **Medicinal Plants:** Brief idea of Cultivation, botanical features and medicinal importance of Cinchona, Rauwolfia, Atropa, Opium, Cannabis, Indian Gooseberry and Withania. **Beverages:** Botanical description and processing of Tea and Coffee. **Rubber:** Botanical description and processing of Hevea. **Sugar:** Botanical description, cultivation and harvesting of Sugarcane; processing of Sugar. **Timber:** Note on important timber yielding plants.	Interactive Lectures and Discussions, Visual aids (charts and Diagrams), Theoretical Foundations, Practical Experiments and Group Discussions.	Students will develop a comprehensive knowledge on cultivation and uses of spices, condiments, medicinal plants, rubber-yielding plants, beverages and timber yielding plants.	Class Test/ Power Point Presentations (Mid-term Exams as per Schedule)
4.	**October**	**Plant Tissue Culture:** Concept, History, Scope and Applications; Totipotency Organogenesis Cryopreservation **Types of culture:** Seed, Embryo, callus, suspension, organs, Cell and protoplast culture Micropropagation/clonal propagation (different routes of multiplication axillary bud proliferation, somatic embryogenesis, organogenesis), Synthetic seeds (a brief account). In vitro haploid production Androgenic methods: Anther culture, Microspore culture Andro genesis Significance and use of haploids, Gynogenic haploids, factors effecting gynogenesis. Somatic hybridisation, Cybrids, Somaclonal variations	Interactive Lectures and Discussions, Theoretical Foundations, Visual aids (charts and Diagrams), Presentations.	Students get acquainted with concepts of tissue culture and tissue culture techniques including micropropagation, callus culture and will understand different strategies of genetic engineering in plants and its applications.	Unit Test-2/ Submission of Assignment 2

5.	**November**	**Genetic Engineering in plants:** Introduction and applications. Direct DNA transfer/Physical methods of gene transfer in plants - microprojectile bombardment, electroporation, liposome mediated, Calcium phosphate mediated etc. Restriction Endonucleases: Types and role; brief idea about cloning vectors- Ti plasmid, BAC, Lambda phage, cosmid, shuttle vector, eukaryotic vectors (YAC). Plant transformation by *Agrobacterium tumefaciens* and *A. rhizogenes.* Strategies for gene transfer to plant cells. Binary and co-integrate vectors.	Interactive Lectures and Discussions, Visual aids (charts and Diagrams), Theoretical Foundations and Practical Experiments, Group Discussions and Presentations.	Students will understand different strategies of genetic engineering in plants and its applications.	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 2025-26) ODD SEMESTER

Name of Teacher: Dr. Neetu
Designation: Assistant Professor in Botany
Class: B.A I
Subject/ Paper: Fundamentals of Botany
Type of course(major/ minor/ VAC/ AEC/SEC/ MDC): MDC-I

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	**July**	General characteristics, morphology and economic importance of viruses.	Interactive Lectures and Discussions, Visual aids (Models, Charts and Diagrams), Group Learning and Teaching	Students will gain a foundational understanding of the biology of Virus.	Class Test
2.	**August**	General characteristics, morphology and economic importance of bacteria, algae, fungi and lichens.	Interactive Lectures and Discussions, Group Learning and Teaching, Visual aids (Models, Charts and Diagrams), Practical Experiments.	Students will gain a foundational understanding of the biology of microorganisms, Bacteria, algae, fungi and lichens.	Unit Test-1/Submission of Assignment 1
3.	**September**	General characteristics, morphology and economic importance of Bryophytes and Pteridophytes.	Interactive Lectures and Discussions, Visual aids (Charts and Diagrams), Practical Experiments.	Students will develop a conceptual understanding of bryophytes and pteridophytes.	Class Test/ Power Point Presentations (Mid-term Exams as per Schedule)

4.	**October**	General characteristics, morphology and economic importance Gymnosperms.	Interactive Lectures and Discussions, Visual aids (charts and Diagrams), Practical Experiments.	Students will acquire knowledge about the fundamental characteristics of gymnosperms and the challenges related to their propagation.	Unit Test-2/ Submission of Assignment 2
5.	**November**	General characteristics, morphology of Angiosperms.	Interactive Lectures and Discussions, Visual aids (charts and Diagrams), Practical Experiments.	Students will acquire a basic understanding of angiosperm morphology.	Class Test
6.	**December**	Economic Importance of Angiosperms.	Group Learning and Teaching, Interactive Lectures and Discussions.	Students will gain the knowledge about Economic Importance of Angiosperms.	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 2025-26) ODD SEMESTER

Name of Teacher: Tara Jayant

Designation: Associate Professor

Class: B.Sc. II Life Sciences (3rd semester)

Subject/ Paper: Zoology (Paper: Cell Biology and Animal Genetics)

Type of Course: Zoology Major (B23-ZOO-301)

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	22nd to 31st July 2025	Introduction to syllabus, books and examination pattern for theory and practical. General structure of animal cell. Plasma Membrane: Fluid mosaic model, various modes of transport across the membrane.	Lecture and Video demonstration	Students will understand the nature and basic concept of cell membranes and its function in transport.	
2.	August 2025	Mechanism of active and passive transport, endocytosis and exocytosis. Endoplasmic reticulum (ER): types and functions. Golgi complex: Structure, associated enzymes and role of golgi-complex in animal cell. Ribosomes: Types, biogenesis and role in protein synthesis. Lysosomes: Structure, enzymes and their role; polymorphism Mitochondria: Structure, Mitochondria as semiautonomous body, biogenesis, functions of mitochondria. Cilia and Flagella: Structure and Functions Ultrastructure and functions of Nucleus: Nuclear membrane, nuclear lamina, nucleolus, fine structure	Power Point Presentation and Video Demonstration	Students will be able to apply the knowledge of internal structure of cell, cell organelles and their role in metabolic functions of organism.	**Class test will be taken**

		of chromosomes, nucleosome concept and role of histones, euchromatin and heterochromatin.			
3.	**September 2025**	Introduction and Mendel's Laws of Inheritance, Linkage and recombination: Cell Cycle, crossing-over and chiasma formation; gene mapping. Sex determination and its mechanism: male and female heterozygous systems, genetic balance system; role of Y chromosome, male haploidy, cytoplasmic and environmental factors, role of hormones in sex determination. Sex linked inheritance: Haemophilia and colour blindness in man, eye colour in Drosophila, Non-disjunction of sex-chromosome in Drosophila, Sex-linked and sex-influenced inheritance Extra chromosomal and cytoplasmic inheritance: Kappa particles in Paramecium, Shell coiling in snails, Milk factor in mice.	Power Point Presentation, Problem solving and Group Discussion	Students will be able to explain the concept of gene interactions; Sex linked inheritance and their role in genetic diseases & medical sciences. Students will be able to conduct the morphometric analysis of chromosomes and demonstrate cell division.	**Assignment will be given**
4.	**October 2025**	Multiple allelism: Eye colour in Drosophila; A, B, O blood group in man. Human genetics: Human karyotype, Chromosomal abnormalities involving autosomes and sex chromosomes, monozygotic and dizygotic twins.	Power Point Presentation and Problem solving	Students will be able to explain the role of multiple alleles and chromosomal abnormalities in inheritance.	**Mid Term Exam will be taken**

5.	**November 2025**	Inborn errors of metabolism (Alkaptonuria, Phenylketonuria, Albinism, sickle-cell anaemia). Applied genetics: Genetic counselling, pre-natal diagnosis, DNA-finger printing, transgenic animals.	Power Point Presentation by teacher and students	Students will have acquaintance with the basic causes associated with inborn errors and other genetic disorder and will be able to give counselling to general people.	**Revision test of complete syllabus**
6.	**December 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 2025-26) ODD SEMESTER

Name of Professor: TARA JAYANT

Designation: ASSOCIATE PROFESSOR

Subject/ Paper: PAPER M24-ZOO-102 (Biochemistry & Biotechniques)

Class: M.Sc. ZOOLOGY 1st SEMESTER

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes	Remarks if any
1.	August 2025	Introduction to syllabus, books and examination pattern for theory. **General Principles of Biochemistry and chemical composition of life:** General Introduction to Biomolecules **Protein Biology:** Primary, Secondary, tertiary and quaternary structure of proteins: i) Domain, ii) Reverse turn of Ramachandran plot and its significance.	Power Point Presentation and Video Demonstration	Students will be able to describe the structure and classification of biomolecules.	**Revision test of topics covered.**
2.	September 2025	**Enzyme:** Classification and nomenclature, Co-enzymes and Cofactors, Induced fit and Molecular Mechanism of Enzyme action, Enzyme feedback mechanism, Isozymes. **Nucleic acids: Structure and Functions:** DNA structure and functions, RNA structure and functions, DNA choreography, Qualitative and quantitative estimation of DNA **Metabolism:** Glycolysis, citric acid cycles its regulation and role as metabolic hub, Hexose monophosphate pathway its regulation and significance, Cholesterol biosynthesis, its	Power Point Presentation and Video Demonstration by teacher and students	It will make the students understand the structure of nucleic acids and general mechanism of various metabolic pathways.	**Revision test of topics covered.**

		metabolism and steroidogenesis, Bile acids and their metabolism, Saturated and unsaturated fatty acid and their metabolism. **Chemical and Biological assays** (*invitro* and *in vivo* assays).			
3.	**October 2025**	**Principles and uses of analytical instruments:** Microscopes and imaging, Spectrophotometers, NMR spectrophotometer **Microbiological and cell culture Techniques:** Setting of microbiological laboratory, Sterilization and Media preparation techniques, Inoculation and growth monitoring (Standard plate count technique), Isolation of a microbial colony and slant preparation, Design and functioning of tissue culture laboratory, Basics of cell/tissue culture, Culture media preparation, Cell proliferation measurements, Cell viability testing and Cell harvesting methods, Biosafety and levels. **Cryotechniques:** Cryopreservation for cells, tissue, organisms, Cryotechniques for microscopy.	Power Point Presentation and Animated Lessons	It will provide the students a basic understanding of the underlying principles and practical strategy of the analytical and preparative techniques that are fundamental to study and understanding of life processes.	**Revision test of topics covered.**
4.	**November 2025**	**Separation techniques in biology:** Molecular separations by chromatography, electrophoresis, precipitation etc, Organelle separation by centrifugation. Density gradient centrifugation, Ultra Centrifugation, unit gravity centrifugation, affinity adsorption, anchorage-based	Power Point Presentation, video demonstration and animated lessons	Students will be able to explain the principle, working, materials used and applications of various biological techniques that are used to study	**Sessional Exam**

		techniques, Cell separation by flow cytometry and FACS. **Radioisotope and mass isotope techniques in biology:** Sample preparation for radioactive counting, Autoradiography, Biosensors **DNA fingerprinting**.		the basic biological processes.	
5.	**December 2025**	UNIVERSITY EXAMINATION			

- **Sessional Exam will be taken as per schedule.**

Signature of Teacher **Principal**

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

LESSON-PLAN (Session 2025-26) ODD SEMESTER

Name of Professor: TARA JAYANT

Designation: ASSOCIATE PROFESSOR

Subject/ Paper: PAPER M24- ZOO-301 (**Molecular Biology)**

Class: M.Sc. ZOOLOGY 3rd SEMESTER

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes	Remarks if any
1.	**August 2025**	Introduction to syllabus, books and examination pattern for theory. **DNA Replication:** Prokaryotic and Eukaryotic DNA replication, Mechanics of DNA replication, Enzymes and accessory proteins involved in DNA replication **Transcription:** Prokaryotic and Eukaryotic transcription, General and specific transcription factors, Regulatory elements and mechanisms of transcription regulation, Transcriptional and post-transcriptional gene silencing, Post-transcriptional Modifications in RNA, 5'-Cap formation, 3'-end processing and polyadenylation, Splicing, Editing, Nuclear export of mRNA, mRNA stability.	Power Point Presentation and Video Demonstration	Students will be able understand the mechanism of DNA replication and transcription.	**Revision test of topics covered.**
2.	**September 2025**	**Molecular mapping of genome:** Genetic and physical maps, Physical mapping and map-based cloning, Southern and fluorescence *in situ* hybridization for genome analysis, Chromosome micro-dissection and micro-cloning, Molecular markers in genome analysis RFLP, RAPD and AFLP analysis and their applications, Molecular markers linked to disease resistance genes **rDNA Technology:**	Power Point Presentation and group discussion	It will generate knowledge about various methods and significance of molecular mapping.	**Revision test of topics covered.**

		Gene-cloning, Vectors, cDNA and genomic libraries, Blotting techniques, Chromosome walking, Application of rDNA technology.			
3.	**October 2025**	**Translation:** Genetic code and deciphering of genetic code, Prokaryotic and Eukaryotic translation, The translational machinery, Adaptor hypothesis, Kozak rule, Mechanisms of initiation, elongation and termination, Regulation of translation **Transport of Protein:** Co- and Post-translational transport of proteins, Co- and Post-translational modifications of proteins, Protein trafficking/sorting.	Power Point Presentation by teacher and students.	It will create awareness about the mechanism of translation and transport of proteins.	**Revision test of topics covered.**
4.	**November 2025**	**Recombination and Repair:** Holiday junction, gene targeting, gene disruption, Cre/lox recombination, RecA and other recombinases, DNA repair mechanisms **Antisense and Ribozyme technology:** Molecular mechanisms of antisense molecules, Inhibition of splicing, polyadenylation and translation, Disruption of RNA structure and capping, Biochemistry of ribozyme; hammerhead, hairpin and other ribozymes, Strategies for designing ribozymes, Application of antisense and ribozyme technologies.	Power Point Presentation, video demonstration.	Students will be able to know the mechanism of DNA repair and ribozyme technology.	**Sessional Exam**
5.	**December 2025**	**UNIVERSITY EXAMINATION**			

- **Sessional Exam will be taken as per schedule.**

Signature of Teacher **Principal**

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

LESSON-PLAN (Session 2025-26) ODD SEMESTER

Name of Professor: TARA JAYANT

Designation: ASSOCIATE PROFESSOR

Subject/ Paper: PAPER M24- ZOO-306 (**Fish, Fisheries and Aquaculture – I)**

Class: M.Sc. ZOOLOGY 3rd SEMESTER

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes	Remarks if any
1.	**August 2025**	Introduction to syllabus, books and examination pattern for theory. Definition of Fish, Fisheries and aquaculture; Types of Aquaculture. Classification of fishes with distinguishing characters and examples of each group. Estuarine, Marine, Riverine and wetland fisheries: characteristic species and their exploitation. **Culture fisheries** • Cultivable organisms for aquaculture. • Criteria of selection of cultivable fishes.	Power Point Presentation and Video Demonstration	Students will learn identification of fish species using classical morphological methods.	**Revision test of topics covered.**
2.	**September 2025**	Design, construction and maintenance of fish culture ponds. **Ecology of fish pond ecosystem** • Physico chemical conditions of ponds water and soil. • Biological conditions of waters. • Weeds and their control. • Productivity of fish pond. • Classification of water bodies on the basis of productivity. **Aquatic pollution**: Sources of water Pollution, Impact of pollution on aquatic organisms, Impact of exotic fish species on aquatic biodiversity, Fishes and	Power Point Presentation and group discussion	It will generate knowledge about various methods and significance of aquaculture and impact of aquatic pollution on fishes.	**Revision test of topics covered.**

		their relationships with abiotic and biotic factors. Aquaculture Ranching and Rational fishery.			
3.	**October 2025**	Fish integument: Exoskeleton and colouration Fins: origin, types and functions Food and feeding habits of fishes, Digestion in fishes Respiratory system Gill structure and functions, Accessory respiratory organs swim bladder and webberian ossicles Osmoregulation in fishes	Power Point Presentation by teacher and students.	It will create awareness about structure and function of important organ systems of fishes.	**Revision test of topics covered.**
4.	**November 2025**	**Receptors in fishes** Chemoreceptors Lateral line organs Eye Ear Pineal organ Hormones and reproduction: Induced breeding in carps and catfishes. Identification of different maturity stages of fishes. Migration in fishes Age and growth studies	Power Point Presentation, video demonstration.	Students will be able to know important physiological processes in fishes.	**Sessional Exam**
5.	**December 2025**	**UNIVERSITY EXAMINATION**			

- **Sessional Exam will be taken as per schedule.**

Signature of Teacher **Principal**

Office Of The Principal Govt. P.G. College For Women Sec-14 Panchkula

Lesson Plan (2025-26) Odd Semester

Name Of The lecturer: Ms. Teena Aggarwal (Ext. Lecturer In Botany)

Class : MDC 3 Botany, Semester 3

Course code: B23-BOT-303

Subject: Botany

Subject/Paper: Ornamental Plants and Propogation

Sr. No.	Months	Topics To Be Covered	Teaching Learning Stratedy	Learning Outcomes of Students	Remarks
1	**July**	Unit- I History of gardens in India; terrace gardening; popular gardens of India; Types of gardens: Formal and Informal gardens;.	Group learning and teaching, Presentation methodology	1. Students will acquire an understanding of the history of gardens in India .	
2	**August**	UNIT-I Styles of gardens: Mughal gardens, Persian gardens, Italian gardens, French gardens, English gardens, Japanese gardens. UNIT-II Significance of Shrubs, trees, palms, ferns, cycads, cacti and succulents,	Research learning, Demonstratio n learning	2: Students will develop comprehensive knowledge about different styles of garden and groups of plants used as ornamentals.	Revision of gardens.
3	**September**	UNIT-II -climbers, creepers, indoor plants, water plants, bonsai plants as ornamentals UNIT-III Flower and seed production; protected cultivation of ornamentals; present position and scope of floriculture in India.	Group learning and teaching,	3: Students will learn about flower and seed production.	Assignment -I Class-Test
4	**October**	UNIT-IV Vegetative propagation-principles and practices of clone selection; techniques of cutting, budding, grafting and layering;	Interactive learning, Demonstratio n learning	4: Students will gain a deep understanding of vegetative propagation methods for ornamental plants.	Assignment -II Class-Test
5	**November**	Propagation by specialized stems and roots.	Presentation methodology	4: Students will gain a deep understanding of vegetative propagation.	Class-Tests and revisions

Govt. P.G. College For Women, Sec-14, Panchkula

Lesson Plan (2025-26) Odd Semester

Name Of The lecturer: Ms. Teena Aggarwal
Designation: Assistant Professor (Ext.) in Botany
Class : B.Sc. III Life Sciences 5th sem
Subject: Genetics
Course: Population and evolutionary Genetics
Course code: B23-GEN-501

Sr. No.	Months	Topics To Be Covered	Teaching Learning Stratedy	Learning Outcomes of Students	Remarks
1	August	Unit I Basic Concepts: * Population genetics: Definition & Meaning, Mendelian Population and scope of population genetics. Gene and genotype frequencies, Mating patterns, Random & Non-random mating- positive & negative assortative mating, role in population size & change in gene frequency. * Hardy-Weinberg method & its applications-calculating allelic frequencies, assumptions of Hardy-Weinberg equilibrium, proof of Hardy-Weinberg equilibrium, Generation time, testing for fit to Hardy-Weinberg equilibrium. * Random Genetic drift- definition, its effects in small & large populations, bottlenecking & founder effect, genetic drift simulation, genetic drift vs. selection.	Group learning and teaching, Research learning, Power Point Presentations	Students will acquire an understanding of the Population genetics, Hardy-Weinberg method & its applications, Random Genetic drift	Revision of class work on daily basis.
2	Septembe r	Unit II Selection and Speciation: * Genetic equilibrium- definition, conditions for its stability, deviation of it (evolution). Se-lection- overview, types & subtypes, negative & positive selections, patterns and mechanism of selection (stabilizing, disruptive,	Research learning, Presentation methodology	Students will develop comprehensive knowledge about Genetic equilibrium, Genetics of Speciation,	Revision of the topic. Assignme nt-I

		directional, balancing, disassortative sexual selection, frequency dependent selection), over dominance, natural selection, artificial selection, ecological selection. * Genetics of Speciation- Patterns and processes of speciation: Reproductive isolating barriers, Species concepts, Genetics of reproductive isolation and species, Natural hybridization			
3	**October**	Unit III Theories of Evolution:Emergence of theory of Evolution- Lamarck-ian evolution theory, Darwin's theory of evo-lution, Neo-Darwinism, modern synthesis theory of evolution, Macroevolution & Microevolution. Evolution of Genetic Diversity- natural varia-tion, sources of genetic variation: chromosomes & crossing over, SNPs, mutation, deletion & rearrangements, recombination, gene flow.	Group learning and teaching, Presentation methodology	Students will gain a deep understanding of Theories of Evolution and Evolution of Genetic Diversity**.**	Assignment-II Class-Test
4	**November**	Unit IV Molecular Basis of Evolution: Molecular Evolution- general approaches, principles, rates of molecular evolution, Evolution of eukaryotic genome structure, gene family, evolution and phylo-genetics. Protein and nucleotide sequence analysis and construction of phylogenetic tree using tools of Bioinformatics.	Interactive learning Presentation methodology	Students will be able to gain knowledge about Molecular Basis of Evolution	Class-Test

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

Signature of Teacher Principal

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

LESSON-PLAN (Session 2025-26) ODD SEMESTER

Name of Teacher: Ms.Teena Aggarwal
Designation: Assistant Professor (Ext.) in Botany
Class: B.Sc. III Life Sciences
Subject/ Paper: Organic Farming
Type of course: VOC 1 (B23-VOC-109)

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	**July**	Unit I: Basics of organic farming - Concept and components of organic farming, aims and objectives; Need of organic farming; Historical development to organic farming in India;	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams	Students will be able to understand the basics of organic farming.	Class Test
2.	**August**	Unit I: Status of organic farming in India; Advantages and disadvantages of organic farming. Organic farming process- Concept to farming system, Developing organic farms, Important steps & methods; Pure organic farming and integrated farming system (combination of organic and inorganic). Unit II: Plant nutrients: Essential plant nutrients, their role in plant growth and development, Nutrient uptake and utilization by plant. Nutrient management inorganic farming: Balanced nutrients supply for organic farming system using nutrients from organic sources.	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams). Group learning and teaching.	Students will develop a conceptual understanding of basics of organic farming and plant nutrients.	Unit Test-1/Submission of Assignment 1

3.	**September**	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. Unit III: Biofertilizers 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;	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams). Group learning and teaching.	Students will gain knowledge on the concepts of biofertilizers and disease and pest management.	Class Test/ Power Point Presentations (Mid-term Exams as per Schedule)
4.	**October**	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 in organic farming Use of Neem and other plant products in organic farming; Organic agri-horticulture in urban &semi urban areas.	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams). Group learning and teaching.	Students will gain a comprehensive understanding of Weed management.	Unit Test-2/ Submission of Assignment 2
5.	**November**	Certification, Standardization, Marketing-Quality control and certification procedures of organic products. Organic standards In India. Govt. schemes related to organic farming in India.	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams).	Basic understanding of the organic products will be developed by the students.	Class test
6.	**December**	Potential demand and Marketing of organic products. Organic farming and food security in india	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams). Group learning and teaching.	Students will gain the knowledge of the organic farming potential..	Revision

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

Office Of The Principal Govt. P.G. College For Women Sec-14 Panchkula

Lesson Plan (2025-26) Odd Semester

Name Of The lecturer: Ms. Teena Aggarwal (Ext. Lecturer In Botany)

Class : M.Sc II year Zoology 3rd sem

Subject: OEC Botany (M24-OEC-304)

Subject/Paper: Plants and Humans.

Sr. No.	Months	Topics To Be Covered	Teaching Learning Stratedy	Learning Outcomes of Students	Remarks
1	July	Unit- I Plants and Civilization: Origin of agriculture Origin crop plants: Idea about center of origin of common crop plants	Group learning and teaching, Presentation methodology	1. Students will acquire an understanding of the Plants and Civilization.	Class tests
2	August	UNIT-I Minor Cereals, Major cereals, Pseudocereals and pulses Spices and condiments (Saffron, Clove, Cardamom, Ginger, Turmeric, Cinnamon, Capsicums, Asafetida, Coriander, Fennel, Fenugreek). UNIT-II Medicinal plants: Importance of medicinal plants - role in human health care Traditional knowledge and utility of some common medicinal plants- Sarpagandha, Isabgol, Vasaka, Neem, Bhringraj,	Research learning, Demonstration learning	2: Students will develop comprehensive knowledge about. Minor Cereals, Spices and condiments, Medicinal plants and their utility.	Unit Test-1/Submission of Assignment 1
3	September	UNIT-II - Amla, Harrad, Bahera, Arjun, Punarnava, Brahmi, Kasondi, Ghritkumari, Quinine and Eucalyptus Psychoactive plants - general account and classification UNIT-III. 1. Nutritive and medicinal value of some fruits and vegetables (Guava, Sapota, Orange, Mango, Banana, Lemon, Pomegranate, Moringa. Cabbage)	Group learning and teaching, Power Point Presentations	3: Students will learn about nutritive and medicinal value of some fruits and vegetables.	Class Test/ Power Point Presentations (Mid-term Exams as per Schedule)

4	**October**	Beverages (Coffee, Tea, Chocolate, Cola) Common ornamental plants. Common food adulterants UNIT-IV; Common timber yielding plants and minor forest products	Interactive learning, Demonstration learning	Students will gain a deep understanding of Beverages, Common food adulterants , timber yielding plants	Unit Test-11/Submission of Assignment 11
5	**November**	Unit IV; General account of fibres, dyes, tannins, gums, and resin. Insecticides from plants pyrethrum and Rotenone.	Presentation methodology	Students will gain a deep understanding of Insecticides	Class-Tests and revisions

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 2025-26) ODD SEMESTER

Name of Teacher: Ms. Teena Aggarwal
Designation: Assistant Professor (Ext.)in Botany
Class: B.Sc. I Life Sciences
Subject/ Paper: Diversity of Microbes, Algae, Fungi and Archegoniates
Type of course(major/ minor/ VAC/ AEC/SEC/ MDC): Major (B23-BOT-101)

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	**July**	Bacteria: Structure, nutrition, reproduction and economic importance. Viruses: General account of Viruses including structure of TMV and Bacteriophages.	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams). Group learning and teaching.	Students will be able to understand the general characteristics and economic importance of bacteria, actinobacteria and viruses.	Class Test
2.	**August**	Algae: General characters, Introductory classification; economic importance; and life cycle (excluding development) of Nostoc (Cyanophyceae), Volvox, (Chlorophyceae), Vaucheria (Xanthophyceae), Ectocarpus (Phaeophyceae) and Polysiphonia (Rhodophyceae). Fungi: General characters, Introductory classification; economic importance; and life-history of Phytophthora (Mastigomycotina), Penicillium (Ascomycotina), Puccinia (Basidiomycotina), Colletotrichum (Deuteromycotina).	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams). Group learning and teaching.	Students will develop a conceptualunderstanding of Phycology and Mycology. Students will gain the knowledge about Diversity, Ecological Roles, life cycle and Economic Importance of Algae and Fungi.	Unit Test-1/Submission of Assignment 1

3.	**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 Marchantia (Hepaticopsida), Anthoceros (Anthocerotopsida), Funaria (Bryopsida), ecological and economic importance of bryophytes.	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams). Group learning and teaching.	Students will gain knowledge on the concepts of Bryology including Diversity, Classification, Reproduction, Life Cycles and Ecological Roles.	Class Test/ Power Point Presentations (Mid-term Exams as per Schedule)
4.	**October**	Pteridophyta: General characters, classification upto classes (A. R. Smith, 2006), structure and reproduction (excluding development) of 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.	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams). Group learning and teaching.	Students will gain a comprehensive understanding of Pteridophytes, their biological significance, classification, morphology, evolutionary importance and role in ecosystem.	Unit Test-2/ Submission of Assignment 2
5.	**November**	General characteristics, classification up to classes (Smith 1955), morphology, anatomy and reproduction of Cycas, Pinus, Ephedra (developmental details not to be included);	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams). Group learning and teaching.	Basic understanding of the biology of Gymnosperms will be developed by the students.	Class test
6.	**December**	Distribution and economic importance of Gymnosperms; General account of paleobotany and Geological time scale. Revision.	Interactive Lectures and Discussions, Visual aids (Microscopic images, charts and Diagrams). Group learning and teaching.	Students will gain the knowledge of the paleobotany and Geological time scale.	Revision

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

Signature of Teacher **Principal**