**Botany Department**
**Lesson plan**
**Session: 2025-26 (Odd Semester)**

Name of Teacher- Dr. Ritu Hooda
Class–B.Sc.3rd Year
Subject- Plant Physiology

| Weeks | Syllabus |
|---|---|
| Week1 | Plant-water relations: Importance of water to plant life; Different physical and Chemical properties of water |
| Week2 | Imbibition, diffusion and osmosis; absorption and transport of water; transpiration; physiology of stomata |
| Week3 | Mineral nutrition: Essential macro and micro elements and their role; |
| Week4 | Mineral uptake; deficiency symptoms. |
| Week5 | Transport of organic substances: Mechanism of phloem transport; source-sink relationship; factors affecting translocation |
| Week6 | Photosynthesis : significance; historical aspects; photosynthetic pigments |
| Week7 | Action spectra and enhancement effects; concept of two photosystems |
| Week8 | Z-scheme; photo- phosphorylation; Calvin cycle; C4 pathway; CAM plants; photorespiration |
| Week9 | Growth and development : Definitions; phases of growth and development |
| Week 10 | Seed dormancy; plant movements; the concept of photoperiodism; |
| Week 11 | Physiology of flowering; florigen concept |
| Week 12 | Physiology of senescence; fruit ripening; |
| Week13 | Plant hormones- auxins, gibberellins, cytokinins, history of their discovery mechanism of action |
| Week 14 | Abscissic acid and ethylene, history of their discovery, mechanism of action |
| Week 15 | Photo-morphogenesis Concept, Role of diffent photoreceptors in photomophogenesis |
| Week 16 | Phytochromes and their discovery, physiological role and mechanism of action. |

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Name of Teacher- Dr. Reena
Class–M.Sc. 1st sem
Subject- Plant Tissue Culture and Resource Utilization

| Weeks | Syllabus |
|---|---|
| Week1 | Plant Tissue Culture: Introduction, History, Scope and basic concepts; |
| Week2 | Laboratory organization, Types of media and its preparation; Sterilization techniques; |
| Week3 | Concept of cellular differentiation and totipotency; Types of culture; callus/ suspension culture; Induction and maintenance of callus and suspension cultures |
| Week4 | Fundamental aspects of Morphogenesis and Haploid production: Study of differentiation through Organogenesis and Embryogenesis |
| Week5 | Somatic embryogenesis and its utility, Zygotic vs. Somatic embryogenesis, Micropropagation |
| Week6 | Encapsulation of somatic embryo & shoot tip for artificial seed production and its applications |
| Week7 | Haploid production: Definition, Androgenesis, Gynogenesis, Culture techniques, and induction factors, Biotechnological utilization of haploids |
| Week8 | Somatic hybridization and variations: Protoplast isolation, fusion, culture, hybrid selection |
| Week9 | hybrid selection, and regeneration possibilities with special reference to crop plants |
| Week 10 | Applications and limitations of protoplast research, Selection mechanism for hybrids and cybrids |
| Week 11 | Regeneration possibilities with special reference to crop plants, Somaclonal&gametoclonal variations and isolations of useful mutants. |
| Week 12 | Cryopreservation, Storage, and Importance: Cryopreservation and germplasm storage. |
| Week13 | Plant secondary metabolites; sources and production of secondary metabolites/natural products through tissue culture, their selections and elicitation; |
| Week 14 | Production of secondary metabolites through tissue culture and their biochemical pathway |
| Week 15 | Applications of plant tissue culture in Forestry, Ornamental plants, disease-free plants, and agriculture. |
| Week 16 | Revision |

Name of Teacher- Dr. Reena
Class–MSc 2nd Year
Subject- Biofertilizer Production Technology

| Weeks | Syllabus |
|---|---|
| Week1 | Introduction, History and concept of Bio fertilizers, General account, scope and importance of Biofertilizers, |
| Week2 | Classification of Bio fertilizers. Nitrogen fixation, Mycorrhizal symbiosis, Associative effect of microorganisms. |
| Week3 | Selection and cultivation of beneficial microorganisms, substrate preparation, and fermentation techniques. |
| Week4 | Structure and characteristic features: N2 Fixer - Rhizobium, Azospirillum, Azotobacter, Acetobactor and Frankia |
| Week5 | Phosphorus solubilizes: Pseudomonas, Aspergillus, Penicillium |
| Week6 | Potassium mobilizers: Bacillus, Enterobactor, Fecturia |
| Week7 | Cynobacterialbiofertilizers- Anabaena, Nostoc, Hapalosiphon |
| Week8 | Fungal biofertilizers- AM mycorrhiza and Ectomycorhiza. |
| Week9 | Production technology: Strain selection, sterilization, growth and fermentation, equipment Isolation and purification of: N2 Fixers, Phosphorus and Potassium solubilizes |
| Week 10 | Production technology: Strain selection, sterilization, growth and fermentation, equipment Isolation and purification of: Cyanobacteria, AM fungi |
| Week 11 | Multiplication and mechanism: Mass multiplication of Biofertilizers, Mechanism of biofertilization (Nitrogen fixation, Phosphorus and Potassium solubilization). |
| Week 12 | Preparation of carrier-based biofertilizers. |
| Week13 | Application technology for seeds, seedlings, tubers, sets etc. |
| Week 14 | Biofertilizers-storage, shelf life, quality control and marketing. |
| Week 15 | Factors influencing the efficacy of bio fertilizers. Preparation and use of farmyard manure, compost, green manures, vermicompost, biofertilizers, Advantages of biofertilizers over chemical fertilizers, |
| Week 16 | Economic feasibility and cost-benefit analysis of using biofertilizers. |

Name of Teacher- Dr. Pooja
Class–B.Sc. 1$^{st}$Year Section-A,B (SEC)
Subject- Biofertilizers and Biopesticides

| Weeks | Syllabus |
|---|---|
| Week1 | History of gardening; Importance and scope of floriculture and landscape gardening. |
| Week2 | Nursery Management and Routine Garden Operations: Sexual and vegetative |

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| | methods of propagation |
| Week3 | Soil sterilization; Seed sowing; Pricking; Planting and transplanting; Shading;Stopping or pinching |
| Week4 | Defoliation; Wintering; Mulching; Topiary; Role of plant growth regulators |
| Week5 | Ornamental Plants: Flowering annuals (Petunia, Chrysanthemum); perennials (Rose, China Rose) |
| Week6 | Divine vines (Money plant, Monstera); Shade and ornamental trees |
| Week7 | Ornamental bulbous and foliage plants; Cacti and succulents; Palms and Cycads |
| Week8 | Ferns and Selaginellas; Cultivation of plants in pots; Indoor gardening; Bonsai |
| Week9 | Principles of Garden Design and landscaping ideas |
| Week 10 | Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flower beds, Shrubbery, Borders, Water garden |
| Week 11 | Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flower beds, Shrubbery, Borders, Water garden |
| Week 12 | Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flower beds, Shrubbery, Borders, Water garden. |
| Week13 | Commercial Floriculture: Factors affecting flower production |
| Week 14 | Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life |
| Week 15 | Cultivation of Important cut flowers (Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold, Rose, Lilium, Orchids) |
| Week 16 | Cultivation of Important cut flowers (Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold, Rose, Lilium, Orchids) |

Name of Teacher- Dr. Pooja
Class–B.Sc. 2nd Year Section-A,B (SEC)
Subject- Plant Propagation & Nursery Techniques

| **Weeks** | **Syllabus** |
|---|---|
| Week1 | Nursery: Objectives and scope; infrastructure for d e v e l o p m e n t o f nursery; |
| Week2 | Propagation structures: Mist chambers, humidifiers, greenhouses, glasshouses, cold frames,<br>hotbeds, poly-houses |
| Week3 | Propagation structures:nursery tools and implements; planning and seasonal activities. |
| Week4 | Seed: Structure and types;; |
| Week5 | Seed dormancy: causes and methods of breaking dormancy; |
| Week6 | Seed storage: Seed banks, factors affecting seedviability. |

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| Week7 | Preparation of Soil: Land preparation, manuring, watering, sowing/raising of seeds and<br>seedlings; transplantation of seedling |
| Week8 | Preparation of Soil:seedlings; transplantation of seedling |
| Week9 | Potting media: media for propagation and growing nursery plants |
| Week 10 | Potting media:soil, sand, peat,sphagnum moss,<br>vermiculite, perlite. |
| Week 11 | Vermicompost production-preparation, use of vermicompost in the nursery |
| Week 12 | Common diseases and their management: Anthracnose, blights, die back, leaf spots, powdery mildew; Insect/pest/disease control in the nursery |
| Week13 | Propagation: Need and potentialities for plant multiplication, |
| Week 14 | vegetative propagation:Vcutting, layering, grafting and budding and propagation through specialized organs; rhizome,corm, runners and suckers. |
| Week 15 | Use of growth regulators in vegetative propagation. Factorsinfluencing rooting of cuttings and layering, graft incompatibility. |
| Week 16 | Maintenance of mothertrees, collection of scion wood sticks, scion-stock relationship and their influences., Lilium, Orchids) |

Name of Teacher- Dr Surender Singh
Class–B.Sc.2nd Year, Section-A and B
Subject- Plant Taxonomy

| **Weeks** | **Syllabus** |
|---|---|
| Week1 | Taxonomy and Systematics, Fundamental components of taxonomy (identification, classificationdescription, nomenclature and phylogeny |
| Week2 | Role of chemotaxonomy, cytotaxonomy and taximetrics in relation to taxonomy, Botanical nomenclature, principles and rules, principle of priority, |
| Week3 | Type concept, taxonomic ranks, Keys to identification of plant. |
| Week4 | Type concept, taxonomic ranks, Salient features of the systems of classification of angiosperms proposed by Bentham & Hooker |
| Week5 | systems of classification of angiosperms proposed by Engler& Prantl, Floral Terms and Types of Inflorescences. |
| Week6 | Diagnostic features and economic importance of the following families: Ranunculaceae, Brassicaceae |
| Week7 | Diagnostic features and economic importance of the following<br>families: Malvaceae, Euphorbiaceae, Rutaceae |
| Week8 | Diagnostic features and economic importance of the following<br>families: Fabaceae and Cucurbitaceae |
| Week9 | Diversity of Flowering Plants: Diagnostic features and economic importance of |

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| | the following families: Rosaceae, Apocyanaceae, |
| Week 10 | Diversity of Flowering Plants: Diagnostic features and economic importance of the following families: Apiaceae, Asclepiadaceae, |
| Week 11 | Diversity of Flowering Plants: Diagnostic features and economic importance of the following families: Solanaceae, Asteraceae, |
| Week 12 | Diversity of Flowering Plants: Diagnostic features and economic importance of the following families: Liliaceae and Poaceae |
| Week13 | Biodiversity hotspots: Global and Indian perspectives. Diversity of Flowering Plants: |
| Week 14 | Diffent methods of plants Identification-Herberium, keys, literature Survey, internet |
| Week 15 | BSI, NBPGR, NBRI. Indian contribution in plant taxonomy |
| Week 16 | Revison and Asignment |

Name of Teacher- Dr Surender Singh
Class–B.Sc.2nd Year (3rd Sem) Minor
Subject- Basics of Plant Genetics

| **Weeks** | **Syllabus** |
|---|---|
| Week1 | Mendelian genetics and its extension: Mendelism: History; Principles of inheritance; Chromosome theory of inheritance; |
| Week2 | Autosomes and sex chromosomes; pedigree analysis; Incomplete dominance and codominance; Multiple alleles, Lethal alleles, |
| Week3 | Epistasis, Pleiotropy, Recessive and Dominant traits |
| Week4 | Penetrance and Expressivity, Numericals; Polygenic inheritance. |
| Week5 | Extrachromosomal Inheritance: Chloroplast mutation: Variegation in Four-o'-clock plant |
| Week6 | Mitochondrial m u t a t i o n s in yeast; Maternal effects-shell coiling in snail; Infective heredity- Kappa particles in Paramecium. |
| Week7 | Linkage, crossing over and chromosome mapping: Linkage and crossing over-Cytological basis of crossing over; |
| Week8 | Recombination frequency, Numerical based on gene mapping; Sex Linkage. |
| Week9 | Chromosomal aberrations: Structural and Numerical - deletions, duplications, translocations, Position effect, inversions, aneuploidy, polyploidy. |
| Week 10 | Sex chromosomes and Sex determination in Plants. Gene mutations: Types of mutations; Molecular basis of Mutations; Mutagens – physical and chemical (Base analogs, deaminating, alkylating and intercalating agents); |
| Week 11 | Detection of mutations: ClB method. Role of Transposons in mutation. |
| Week 12 | Fine structure of gene: Classical vs molecular concepts of gene; Cis-Trans complementation test for functional allelism; |
| Week13 | Population and E v o l u t i o n a r y Genetics: Allele frequencies, Genotype frequencies, |
| Week 14 | Hardy- Weinberg Law, role of natural selection, mutation, genetic drift. |

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| Week 15 | Genetic variation and Speciation. |
| Week 16 | Revison and Asignment |

Name: Dr. Pawan Sindhu

Class:B.Sc.(M) 5th Sem. Paper- Ecology

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| Week1 | Introduction to Ecology: Definition; scope and importance; levels of organization |
| | SUNDAY |
| Week2 | Environment: Introduction; environmental factors- climatic (water, humidity, wind, light, temperature) |
| | SUNDAY |
| Week3 | edaphic (soil profile, physico-chemical properties), topographic and biotic factors (species interaction). |
| | SUNDAY |
| Week4 | Adaptations of plants to water stress and salinity (morphological and anatomical features of hydrophytes, xerophytes and halophytes). |
| | SUNDAY |
| Week | Population ecology: Basic concept; characteristics; biotic potential, growth curves; ecotypes and ecads. |
| | SUNDAY |
| Week6 | Community ecology: Concepts; characteristics (qualitative and quantitative analytical and synthetic); methods of analysis; ecological succession. |
| | SUNDAY |
| Week 7 | Ecosystem: Structure (components) and functions (trophic levels, food chains, food webs, ecological pyramids and energy flow) |
| | SUNDAY |
| Week 8 | Biogeochemical cycles: Carbon, nitrogen, phosphorus and hydrological cycle. |
| | SUNDAY |
| Week 9 | Phyto-geography: Phyto- geographical regions of India; vegetation types of India (forests). |
| | SUNDAY |
| Week10 | Environmental pollution: Sources, types and control of air and water pollution. |
| Week11 | Global change: Greenhouse effect and greenhouse gases; impacts of global warming; carbon trading; Ozone layer depletion; Biomagnification |

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| Week12 | Revision,Assignment,Test |
| Week13 | Revision,Assignment,Test |

Name of Teacher- Dr Seema
Class–M.Sc Botany Semester
Subject- Cell and Molecular biology

| **Weeks** | **Syllabus** |
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| Week1 | Cell wall structure and function |
| Week2 | Cell membrane structure and models. |
| Week3 | modifications of cell membranes and ion gated channels; |
| Week4 | cell orgenelles and their structure |
| Week5 | Ribosomes and it's structure, endoplamic reticulum , golgi complex |
| Week6 | Cell division and cycle |
| Week7 | Regulation of cell cycle and control mechanism |
| Week8 | DNA replication and it's mechanism |
| Week 9 | transcription in prokarotes and eukaryotes |
| Week 10 | G protein receptor |
| Week 11 | Post transcriptional modification |
| Week 12 | Translation mechanism |
| Week 13 | RNA editing,RNA transport |
| Week 14 | Regulation of gene expression at transcription and translation level |

Name of Teacher- Monika
Class–M.Sc. 1st sem
Subject -Plant Anatomy and Diversity of Gymnosperms Plant

| **Weeks** | **Syllabus** |
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| Week1 | Plant tissue system, tissue types and functions. Meristems, their classification, functions, organization of root and shoot apices. |
| Week2 | .Structure of xylem and phloem. Anatomy of dicot and monocot stem, root, leaves and wood. |
| Week3 | Transition from root to stem. Primary and secondary growth, anomalous structure and abnormal secondary growth in stems. |
| Week4 | Application of anatomy in systematic, archaeology and climate change studies |
| Week5 | ,Introduction to gymnosperms, general characters, life cycle, diversity and origin and classification of gymnosperms. |
| Week6 | . Evolution of gymnosperms. Distribution of gymnosperms in India. Economic and ecological importance of gymnosperms. |
| Week7 | Paleobotany: fossils, types of rocks, types of fossils and fossilization. Techniques for the study of fossils. |
| Week8 | Notable paleobotanists of India. General account of the few fossil gymnosperm families (Lyginopteridaceae, Medullosaceae, Glossopteridaceae and Caytoniaceae) and orders (Cycadeoidales, Pentoxylales and Cordaitales). |
| Week9 | Comparative account of the morphology, anatomy and reproduction in the following orders: Cycadales, |
| Week 10 | Comparative account of the morphology, anatomy and reproduction in the following orders: Ginkgoales |
| Week 11 | Comparative account of the morphology, anatomy and reproduction in the following orders: Coniferales |
| Week 12 | Comparative account of the morphology, anatomy and reproduction in the following orders: Ephedrales |
| Week13 | . Comparative account of the morphology, anatomy and reproduction in the following orders: Welwitschiales |
| Week 14 | Comparative account of the morphology, anatomy and reproduction in the following orders: Gnetales |
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Name of Teacher- Monika
Class–M.Sc 3rd sem
Subject- Plant Physiology

| **Weeks** | **Syllabus** |
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| Week1 | Water: Structure, properties and movement, osmosensors. Water absorption and conduction. Loss of water from plants, stomatal physiology. |
| Week2 | Beneficial nutrient elements, their functions and deficiency symptoms. Toxic effects of minerals. Antagonistic and synergistic relationship amongst ions. |

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| Week3 | Nutrient uptake by roots. Root microbe interactions for nutrient uptake. Comparison of xylem and phloem transport, molecular mechanism of phloem loading and unloading, passive or active solute transport. |
| Week4 | Signal transduction: Overview, receptors and G-proteins, phospholipid signaling, role of cyclic nucleotides |
| Week5 | s, Ca+2 - calmodulin cascade. Regulation of signaling pathways. Diversity in protein kinases and phosphatases, specific signaling mechanisms-two component system in plants. |
| Week6 | Physiology of flowering: History, discovery, properties and molecular structure of phytochromes and cryptochromes. Photoperiodism, photoinduction and endogenous rhythms. |
| Week7 | Promoters and inhibitors of plant growth. Structure, bioassay, transport, storage, physiological role and mechanism of action of auxins |
| Week8 | Promoters and inhibitors of plant growth. Structure, bioassay, transport, storage, physiological role and mechanism of action gibberellins |
| Week9 | Promoters and inhibitors of plant growth. Structure, bioassay, transport, storage, physiological role and mechanism of action cytokinins |
| Week 10 | Peptide hormones in plants. Structure and function of ABA, ethylene, ascorbic acid, |
| Week 11 | brassinosteoids, polyamines (putrescine, spermidine, spermine and cadavarin), jasmonic acid and salicylic acid. |
| Week 12 | Stress physiology: Type of stresses. Plant responses and mechanism of tolerance of biotic and abiotic stress. |
| Week13 | Water, temperature, salt, heavy metal and oxidative stress. |
| Week 14 | Effect of air pollutants SO2 and O3 and elevated CO2 on plants. Hypersensitive reaction and systemic acquired resistance. |
| Week 15 | Role of phytoalexins and phenyl propanoid pathway in plants |
| Week 16 | Secondary plant metabolites: role of terpenes, phenols and nitrogenous compounds, allelopathy. |

Name of Teacher- Dr. Anil Dhaka
Class- M.Sc. Botany 2nd Year
Subject- Plant Breeding and Cytogenetics

| WEEKS | SYLLABUS |
|---|---|
| WEEK 1 | Plant breeding, principles of plant breeding, important methods of breeding for vegetatively propagated crops |
| WEEK 2 | Important methods of breeding for self and cross pollinated. |
| WEEK 3 | Non- conventional methods of plant breeding, evolution of major crops (wheat) |

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| WEEK 4 | Evolution of major crops (maize, mustard). Origin, occurrence, production, meiosis and breeding behaviour of haploids |
| WEEK 5 | Origin, occurrence, production, meiosis and breeding behaviour of aneuploids |
| WEEK 6 | Origin, occurrence, production, meiosis and breeding behaviour of euploids |
| WEEK 7 | Origin, occurrence, production, meiosis and breeding behaviour of allopolyploids |
| WEEK 8 | Induction and characterization of trisomics and monosomics |
| WEEK 9 | Molecular cytogenetics: C-value paradox; cot curve and its significance. Multigene families and their evolution |
| WEEK 10 | Allele gene transfer through chromosome manipulation: transfer of whole genome, examples from wheat, *Arachis & Brasssica* |
| WEEK 11 | Transfer of individual chromosomes and chromosome segments |
| WEEK 12 | Methods for detecting alien chromatin: production, characterization and utility of alien addition and substitution lines |
| WEEK 13 | Genetic basis of inbreeding and heterosis, exploitation of hybrid vigour |
| WEEK 14 | Immuno-techniques: in-situ hybridisation |
| WEEK 15 | Concept of techniques: FISH, GISH. 1st sessional and assignment |
| WEEK 16 | Computer- assisted chromosome analysis. 2nd sessional assignment |

Name of Teacher- Dr. Anil Dhaka
Class- M.Sc. Botany 2nd Year
Subject- Plant Pathology

| WEEKS | SYLLABUS |
|---|---|
| WEEK 1 | Importance, definitions and concepts of plant diseases, history and growth of plant pathology |
| WEEK 2 | Pathogenesis: penetration and entry of plant pathogens, growth, reproduction and survival.<br>Dispersal of important plant pathogens, role of environment and host |
| WEEK 3 | Host- parasite interactions, recognition concept and infection |
| WEEK 4 | Diseases development Role of enzymes, toxins, growth regulators |
| WEEK 5 | Defense strategies- oxidative burst: phenolics, phytoalexins,PR proteins, |
| WEEK 6 | Altered plant metabolism as affected by plant pathogens. Diseases escapes, diseases tolerance, diseases resistance, types of resistance |
| WEEK 7 | Host defence system, morphological and anatomical resistance |

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| WEEK 8 | Gene for gene concept, protein for protein and immunization basis and management of resistance genes. Genetics of resistance; Ri genes; mechanism |
| WEEK 9 | Molecular basis of resistance; marker assisted selection. Genetic engineering for diseases resistance |
| WEEK 10 | Plant-microbe interactions; symbionts and mycorrhiza, pathogens and pests |
| WEEK 11 | Signalling pathways in plant defence response, salicylic acid and jasmonic acid in plant pathogen and plant herbivore interaction, necrosis, |
| WEEK 12 | Host-parasite plant interactions |
| WEEK 13 | Nature, classification and management of plant diseases, diseases of important crops caused by bacteria, nematodes, and viruses |
| WEEK 14 | Plant fungal diseases, causal organisms, symptoms management of downy mildews of grapes, Karnal bunt of wheat, Management of smut of bajra, late and |
| WEEK 15 | Yellow vein mosaic of bhindi, tikka diseases of groundnut. 1st sessional and |
| WEEK 16 | Bacterial blight of paddy, black rust of wheat. 2nd sessional and assignments |

Name: Dr.RituNandal
Class- M.Sc.Botany
Final Subject-
PlantReproduction
Course Code-
25BOT203DS03

| WEEKS | SYLLABUS |
|---|---|
| Week1 | Malegametophyte,structureofanther,microsporogenesis, role of tapetum. |
| Week2 | Pollendevelopment,Malesterility,spermdimorphism, |
| Week3 | pollengermination,pollentubegrowthandguidance,pollen storage, pollen allergy. |
| Week4 | Female gametophyte, Ovule development, megasporogenesis.Organizationofembryosac |
| Week5 | Structureandfunctionsofembryosaccells. Pollination:floralcharacteristics,mechanismsandvectors |
| Week6 | Pollen-pistilinteractionandfertilization,structureofthe pistil, pollen stigma interactions |
| Week7 | Self-incompatibility-SSIandGSI,Doublefertilization,in- vitro Fertilization |
| Week8 | Seeddevelopment,endospermdevelopmentduringearly maturation and desiccation stages |
| Week9 | Embryogenesis-ultrastructureandnuclearctyology |

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| Week10 | Storageproteinsofendospermsandembryo |
| Week11 | Polyembryony,apomixesembryoculture |
| Week12 | Plantgrowth:Dynamicsoffruitgrowth,biochemistryand molecular biology of fruit maturation |
| Week13 | Dormancy:importanceandtypesofdormancy,seed dormancy, methods of overcoming seed dormancy |
| Week14 | Sessional1st andAssignments |
| Week15 | Revisions |
| Week16 | Sessional2nd |
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Name : Dr.
RituNandal
Class- M.Sc. Botany
Final
Subject- Plant
Ecology
Course Code-25BOT203DS02

| WEEKS | SYLLABUS |
|---|---|
| WEEK1 | Environment:physicalenvironment,bioticenvironment |
| WEEK2 | Bioticandabioticinteractions,climatepatternsofthe world |
| WEEK3 | Soilpatternsoftheworld,Habitatecology:conceptofhabitatandniche, niche width and overlap , fundamental and realized niche |
| WEEK4 | Resourcepartitioning,characterdisplacementandmajorhabitattypesofthe subcontinent |
| WEEK5 | Populationecology,characteristicsofpopulation,populationgrowthcurves |
| WEEK6 | Populationregulation:liferegulationstrategies,agestructured populations. |
| WEEK7 | Speciesinteractions:typeofinteractions,interspecificcompetition,herbivory, carnivory, pollination, symbiosis |
| WEEK8 | Mechanismoflitterfalldecompositionandclimaticfactorsassociatedwith decomposition. |
| WEEK9 | Communityecology:natureofcommunities:communitystructureand attributes: analysis communities analytical and synthetic characters |
| WEEK10 | Ecologicalsuccession:types:mechanisms:changesinvolvedinsuccession |
| WEEK11 | Conceptofclimax:modelsofsuccession,ecologicaladaptations |
| WEEK12 | Ecosystemecology,structureandfunction,energyflowandbiogeochemical cycles |

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| WEEK13 | Primaryproductionandmethodsofmeasurements,globalpatternand controlling factors, ecosystem restoration |
| WEEK14 | 1st sessionalandassignments |
| WEEK15 | Biomesdistribution,climaticandedaphic,floralandfaunalcharacteristicsof major terrestrial biome |
| WEEK16 | 2nd sessionalandrevision |

Name of Teacher- Dr.Naveeta
Class-B.Sc.Lifescience 1st Sem.
Subject- Diversity of Microbes

| WEEKS | SYLLABUS |
|---|---|
| Week1 | Viruses: Discovery, physiochemical and biological characteristics; classification (Baltimore) |
| Week2 | Generalstructure with special reference to viroids and prions; replication (general account), DNA virus (T-phage), lytic and lysogenic cycle; RNA virus (TMV). |
| Week3 | Bacteria: Discovery, general characteristics; Types-archaebacteria, eubacteria, wall-less forms (mycoplasma and spheroplasts); Cell structure; Nutritional types; |
| Week4 | Reproduction-vegetative, asexual andrecombination (conjugation, transformation and transduction). Economic importance of bacteria with reference to their role in agriculture and industry (fermentation and medicine). |
| Week5 | Cyanobacteria: General characters; thallus organization; cell structure; heterocyst and akinete development; reproduction; Life-cycle of Nostoc. Economic Importance of Cyanobacteria. |
| Week6 | Algae: General characteristics; Algae in diversified habitats (terrestrial, freshwater, marine); thallus organization; cell ultrastructure; reproduction (vegetative, asexual and sexual); Algal classification criteria- pigments, reserve food and flagella; Classification upto classes (Smith, 1955); algal blooms and red tides; algal biofertilizers. |
| Week7 | Morphology and life-cycle of Volvox, Oedogonium (Chlorophyceae), |
| Week8 | Morphology and life-cycle ofVaucheria (Xanthophyceae) |
| Week9 | Ectocarpus(Phaeophyceae) and Polysiphonia (Rhodophyceae) Economic importance of algae |
| Week10 | Fungi: General characteristics; organization of thallus; nutrition and reproduction; Classification upto classes (Ainsworth, 1966); Morphology and life-cycles of Phytophthora (Mastigomycotina), Mucor |
| Week11 | (Zygomycotina), Penicillium (Ascomycotina), Puccinia, Agaricus (Basidiomycotina), Colletotrichum |

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| | (Deuteromycotina); Economic importance of fungi |
| Week12 | Lichens: Classification, morphology, internal structure, reproduction and Economic importance |
| Week13 | Mycorrhiza: Ectomycorrhiza and endomycorrhiza and their significance |
| Week14 | **Assignments**<br>**Revision** |
| Week15 | **Class test**<br>**Revision** |
| Week16 | Revision |

Name of Teacher- Surender Kumar

Class–M.Sc. 1st sem

Subject- Mushroom Culture Technology

| **Weeks** | **Syllabus** |
|---|---|
| Week1 | Mushrooms Introduction: History and Scope of Mushroom Cultivation, Taxonomical Position, Vegetative Characteristics, |
| Week2 | Differentiation of edible and poisonous mushrooms. Common Edible mushrooms:. |
| Week3 | Button mushroom (Agaricus bisporus), Milky mushroom (Calocybe indica) |
| Week4 | Oyster mushroom (Pleurotus sajorcaju) and Paddy straw mushroom (Volvariella volvacea) |
| Week5 | Natural Habitats- Humicolous, Lignicolous, and Coprophilous. Natural growth aspects and climatic requirements for each type of edible mushroom, |
| Week6 | Principles of mushroom cultivation, Structure and construction of mushroom house. |
| Week7 | Identification of appropriate mushrooms for commercial cultivation, nutritional and antinutritional properties |
| Week8 | medicinal values, therapeutic aspects, and antitumor effect of mushroom |
| Week9 | Methods used for commercial cultivation include mushroom substrate selection, substrate soaking, pasteurization, etc. |
| Week 10 | Role and method of compost preparation, Sterilization procedures. |
| Week 11 | Preparation of value-added products, preparation of spawn substrate, process of spawn culture |
| Week 12 | selection of correct spawn, culture maintenance, mother spawn production, and storage of spawn. |
| Week13 | Composting technology, mushroom bed preparation. Spawning, spawn running, harvesting. |
| Week 14 | Cultivation of oyster and paddy straw mushroom. Problems in cultivation - diseases, pests and nematodes, weed molds, and their management strategies. |

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| Week 15 | Market opportunities; market liabilities; exploring local and national markets |
| Week 16 | ; foreign trade policy; logbooks/related documents for audit |

## Lesson plan

**Session: 2025-26 (Odd Semester)**

**Name of Teacher- Surender Kumar**

**Class–M.Sc. 1st sem**

**Subject- Cryptogamic botany**

| Weeks | Syllabus |
|---|---|
| Week1 | Phycology: Algae in diversified habitats (terrestrial, freshwater, marine); |
| Week2 | thallus organization; cell ultrastructure |
| Week3 | Classification of algae; criteria for classification |
| Week4 | reproduction (vegetative, asexual, and sexual). pigments, reserve food and flagella. |
| Week5 | Salient features of Protochlorophyta, Chlorophyta, Bacillariophyta, |
| Week6 | Charophyta, Xanthophyta, |
| Week7 | Phaeophyta and Rhodophyta. |
| Week8 | Algal blooms; algal biofertilizers; Economic importance of algae as food, feed, medicine, and industry. |
| Week9 | Bryophyta: Morphology, structure, reproduction and life history; distribution |
| Week 10 | economic and ecological importance. Classification of bryophyte |
| Week 11 | account of Marchantiales, Jungermaniales, Anthoceratales |
| Week 12 | Sphagnales, Funariales and Polytrichales. |
| Week13 | Pteridophyta: General characteristics, morphology, anatomy, reproduction and classification of Pteridophytes. |
| Week 14 | Evolution of stele and stelar system; hetrospory and origin of seed habit; general account of fossil pteridophyta; |
| Week 15 | introduction to Psilopsida, Lycopsida, |
| Week 16 | Sphenopsida and Pteropsida. |