

Govt. C.L.C College Patan, Dist. – Durg
2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany
Name of Teacher: Akanksha Sahu
Course Type: Theory/Practical/Both

CLASS: M.Sc. 1st SEM
Course Title: PAPER – I
(CYTOLOGY)

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
October	Unit – 1	The dynamic cells, Structural organization of the plant cell, specialized plant cell types, chemical foundation, biochemical energetics. Cell wall - Structure and functions, biogenesis and growth. • Plasma membrane; structure, models and functions, site for ATPase, ion carriers' channels and pumps, receptors.	10	1. Use of ICT 2. Chalk and talk method 3. Problem solving 4. Group discussion 5. Test 6. Notes
October	Unit – 2	Chloroplast-structure,	15	1. Use of ICT 2. Chalk and talk



		<p>genome organization, gene expression, RNA editing. Mitochondria; structure, genome organization, biogenesis. Plant Vacuole - Tonoplast membrane, ATPases transporters as a storage organelle.</p>		<p>method</p> <ol style="list-style-type: none"> 3. Problem solving 4. Group discussion 5. Test 6. Notes
November	Unit – 3	<p>Nucleus: Structure, nuclear pore Nucleosome organization. Ribosome- Structure and functional significance. Cell cycle and Apoptosis; Control mechanisms, role of cyclin dependent kinases. Amitosis, mitosis and meiosis, karyokinesis and cytokinesis and cell plate formation,• mechanisms of programmed cell death (PCD)</p>	20	<ol style="list-style-type: none"> 1. Use of ICT 2. Chalk and talk method 3. Problem solving 4. Group discussion 5. Test 6. Notes
December	Unit –4	<p>Other cell organelles: Structure and functions of microbodies, microtubules, microfilaments, Golgi apparatus, lysosome, endoplasmic</p>	20	<ol style="list-style-type: none"> 1. Use of ICT 2. Chalk and talk method 3. Problem solving 4. Group discussion 5. Test 6. Notes



		reticulum. Techniques in cell biology: Immune techniques, in situ hybridization to locate transcripts in cell types Electron microscope, camera lucida, micrometry- stage and ocular micrometer		
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Remark – teaching will be online /offline according to government/university/local administration instruction,, notified time to reference to covid 19 Pandamic situation

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Govt. C.L.C College Patan, Dist. – Durg
2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany

Name of Teacher: Praveen Jain

Course Type: Theory/Practical/Both

CLASS: M.Sc. 1st SEM

Course Title: PAPER –II
(Genetics)

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
October	Unit – 1	Chromatin Organization : Chromosome structure and packaging of DNA, molecular organization of centromere and telomere, nucleolus and ribosomal RNA genes, chromatin and heterochromatin, Karyotype and idiogram, banding pattern, specialized types of chromosomes; polytene, lamp brush, β chromosomes and sex	10	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving• Group discussion• Test• Notes



		chromosomes.		
October	Unit – 2	Mapping of Bacteriophage genome, Phage phenotype, recombination in phage, genetic transformation and transduction in bacteria. Molecular basis of chromosome pairing, chromosomal aberration and polyploidy.	15	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
November	Unit – 3	Genetic recombination & genetic mapping; Mechanism of crossing over, molecular mechanism of recombination, role of enzymes in recombination, site specific recombination, linkage, linkage group, genetic marker. Tetrad analysis in <i>Neurospora crassa</i> •	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
December	Unit –4	Plant breeding technique: Introduction, selection (pure line, mass, bulk), emasculation, bagging, tagging, hybridization (self / cross), mutation, resistant and susceptible, heterosis, inbreeding depression, chimera Alien gene transfer through chromosome manipulation; Transfer of whole genome• examples from Wheat, Arachis & Brassica. Transfer of individual chromosomes & chromosome segment, methods for detecting alien chromatin production.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes

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2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany

Name of Teacher: Akanksha Sahu

Course Type: Theory/Practical/Both

CLASS: M.Sc. 1st SEM

Course Title: PAPER –IV
(BRYOPHYTA,
PTERIDOPHYTA AND
GYMNOSPERM)

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
October	Unit – 1	Bryophyta : morphology, structure, reproduction, life history, distribution, classification. General account of Marchantiales, Jungermanniales, Anthocerotales, Sphagnales, Funariales and Polytrichales. Economic and ecological importance. Progressive sterilization of sporogenous tissue in bryophytes Spore dispersal mechanism in bryophytes Thallus organization of	10	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving• Group discussion• Test• Notes



		bryophytes Progressive and reduction theory of origin and development in bryophytes		
October	Unit – 2	Pteridophyta: morphology, anatomy and reproduction, classification, evolution of stele. Telome theory, concept of first vascular plants Homospory, Heterospory and origin of seed habit, General account of fossil pteridophyta. Prothallus organization Introduction to Psilopsida, Lycopsida, Sphenopsida and Pteropsida.	15	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
November	Unit – 3	Gymnosperm: General characters of gymnosperm mentioning diversity. Classification of gymnosperm. Resemblances and difference amongst gymnosperm, pteridophyta and angiosperm. Gymnosperm distribution in India. Gymnosperm Biotechnology. Economic importance of gymnosperm. Structure and theories regarding origin of Paleozoic ovule.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
December	Unit – 4	Extinct gymnosperm : general account of pteridospermales, Glossopteridales, Caytoniales, Pentoxylales. Extant gymnosperm : Cycadales, Ginkgoales, Coniferales, Ephedrales Gnetales, and Welwitschiales	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes

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Govt. C.L.C College Patan, Dist. – Durg
2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany

Name of Teacher: Neha Chandrakar

Course Type: Theory/Practical/Both

CLASS: M.Sc. 1st SEM

Course Title: PAPER – III
MICROBIOLOGY,
PHYCOLOGY AND
MYCOLOGY

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
October	Unit – 1	Archaeobacteria and Eubacteria : General account, ultra structure, nutrition and reproduction, biology and economic importance. Cyanobacteria: Salient feature and biological importance	10	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving• Group discussion• Test• Notes
October	Unit – 2	Viruses: Characteristics and ultra-structure of virions, isolation and purification of viruses, chemical nature, replication, transmission of viruses, economic importance, Prions, viroids (PSTV), virusoids. Phytoplasma and Mycoplasma: General characteristic and role in causing plant diseases.	15	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving• Group discussion• Test• Notes
November	Unit – 3	Phycology : Algae in diversified habitats (terrestrial, freshwater, marine,	20	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving



		<p>parasite, symbiotic, epiphytic, endophytic, endozoic), thallus organization, cell ultra-structure, reproduction (vegetative, asexual, sexual). Criteria for classification of Chlorophyta, Xanthophyta, Bacillariophyta, Phaeophyta and Rhodophyta. Economic importance of algae. Pigmentation in algae Perennation in algae Evolution and development of sex in algae</p>		<ul style="list-style-type: none"> • Group discussion • Test • Notes
December	Unit –4	<p>Mycology : General characters of fungi, substrate relationship in fungi, cell structure unicellular and multicellular organization, cell wall composition, nutrition (saprobic, biotrophic, symbiotic) reproduction, (vegetative, asexual, sexual) heterothallism, heterokaryosis, Parasexuality, recent account of Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina, fungi as biocontrol agent, economic importance of fungi. Mycorrhiza: VAM fungus</p>	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes

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DEPARTMENT OF BOTANY

Name of Department: Botany

Name of Teacher: Jhageshwar Sahu

Course Type: Theory/Practical/Both

CLASS: M.Sc. 3rd SEM

Course Title: PAPER - I PLANT
DEVELOPMENT AND PLANT
RESOURCES

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
October	Unit – 1	Unique features of plant development. Metabolism of nucleic acids, proteins and mobilization of food reserves, tropisms; control of cell division, Programmed cell death in the life cycle of plants, Seed germination, Hormonal control of Seedling growth. Seed dormancy, Over coming of seed dormancy, Bud dormancy. Root development : Organization of root apical meristem (RAM), Cell fates and lineages, Vascular tissue differentiation of root, Lateral roots, Root hairs, Root microbe interaction.	10	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving• Group discussion• Test• Notes
October	Unit – 2	Shoot development : Organization of shoot apical meristem (SAM),	15	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving



		Cytological and molecular analysis of SAM. Control of tissue differentiation; especially Xylem and Phloem, Vascular cambium. Secretary ducts and laticifers, Wood development in relation to environmental factors.		<ul style="list-style-type: none"> • Group discussion • Test • Notes
November	Unit – 3	Leaf development : Development, Phyllotaxy, Control of leaf form, Differentiation of epidermis (with special reference to Stomata and Trichome) and Mesophyll cell. Senescence, Influences of hormones and environmental factors on senescence. Flower development : Floral characteristics, Flower development, Genetics of floral organ differentiation: Homeotic mutant in Arabidopsis and Antirrhinum, Sex determination.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
December	Unit –4	Plant resources : Origin, Evolution, Cultivation and Uses of (i) Food, Forage and Fodder crops, (ii) Fiber crops, (iii) Medicinal and Aromatic plants, (iv) Vegetable Oil-yielding crops (v) fruits. Important fire-wood, Timber-	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



		yielding plants and Non-wood forest products (NFPs) such as bamboos, gums, tannins, dyes and resins.		
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DEPARTMENT OF BOTANY

Name of Department: Botany

Name of Teacher: Neha Chandrakar

Course Type: Theory/Practical/Both

CLASS: M.Sc. 3rd SEM

Course Title: PAPER - II
PLANT ECOLOGY- I
(ECOSYSTEM AND
VEGETATION ECOLOGY)

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
October	Unit – 1	ECOSYSTEM ORGANISATION:- Structure and functions, primary production (Methods of measurement, global pattern, controlling factors), Energy dynamics (trophic organization, energy flow pathways, ecological efficiencies), Litter fall and decomposition, (mechanism, substrate quality, and climatic factors), global biogeochemical cycles of C, N, P, and S, mineral cycles (pathways, processes and budgets) in terrestrial and aquatic ecosystems.	15	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving• Group discussion• Test• Notes
October	Unit – 2	ECOSYSTEM STABILITY AND MANAGEMENT Concept (resistance	10	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving



		and resilience), Ecological perturbations (natural and anthropogenic) and their impact on plants and ecosystems, ecology of plant invasion, environment impact assessment, ecosystem restorations. Concept of Sustainable development, sustainability indicators.		<ul style="list-style-type: none"> • Group discussion • Test • Notes
November	Unit – 3	VEGETATION ORGANISATION:- Concepts of community and continuum, analysis of communities (analytical and synthetic characters), Community coefficients, inter specific associations, ordination, and concept of ecological niche.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
December	Unit – 4	VEGETATION DEVELOPMENT :- Temporal changes (cyclic and non cyclic), mechanism of ecological succession (relay floristic and initial floristic composition, facilitation, tolerance and inhibition models), change in ecosystem properties during succession.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



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DEPARTMENT OF BOTANY

Name of Department: Botany
Name of Teacher: Praveen Jain
Course Type: Theory/Practical/Both

CLASS: M.Sc. 3rd SEM
Course Title: PAPER – III
BIOTECHNOLOGY AND GENETIC
ENGINEERING OF PLANTS AND
MICROBES)

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
October	Unit – 1	BIOTECHNOLOGY - Basic concepts, principles and scope. RECOMBINANT D.N.A. TECHNOLOGY : Gene cloning principles, Tools - Restriction Endonucleases, DNA modifying enzymes, Choice of Vectors, Plasmid, Cosmid, Bacteriophage vectors, phagmids, Artificial	15	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving• Group discussion• Test• Notes



		chromosomes. Shuttle vectors, Yeast vectors, Expression vectors and techniques, construction of genomic / cDNA libraries.		
October	Unit – 2	MICROBIAL GENETIC MANIPULATION: Bacterial transformation, selection of recombinants and transformants, genetic improvement of industrial microbes and nitrogen fixers, fermentation technology. GENETIC ENGINEERING OF PLANTS : Aims, strategies for development of transgenies (with suitable examples), Gene transfer methods - Vector mediated gene transfer- Agrobacterium the natural genetic engineer. t-DNA mediated DNA transformation. Virus mediated gene transfer, Vectorless or direct DNA transfer.	10	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
November	Unit – 3	DNA SYNTHESIS AND SEQUENCING : Chemical synthesis of gene, Polymerase chain reaction, its variation, application, advantages and limitations, DNA sequencing - Sanger and Coulson	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



		method, Maxam Gillbert method, High throughput DNA sequencing, DNA finger printing.		
December	Unit -4	GENOMICS AND PROTEOMICS : Genetic and physical mapping of genes, molecular markers for intregation of useful traits, Transposon mediated gene tagging, genome projects, bioinformatics, functional genomics, microarrays, protein profiling and itssignificance	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes

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2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany

Name of Teacher: Neha Chandrakar

Course Type: Theory/Practical/Both

CLASS: M.Sc. 3rd SEM

Course Title: PAPER - IV
ELECTIVE COURSE-- MOLECULAR
PLANT PATHOLOGY-I

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
October	Unit – 1	1. Introduction and history of plant pathology. 2. General Principles of plant pathology and classification of plant diseases. 3. Diseases inciting organisms - Animate Pathogens- fungi, Bacteria, Mycoplasma, Viruses, Nematodes, their general characteristics, heterotrophic behaviour with emphasis on parasitism ability and virulence.	15	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving• Group discussion• Test• Notes
October	Unit – 2	1. Disease Syndrome and General Symptoms of plant diseases : Pathogenic and nonpathogenic; Symptoms caused by fungi, Bacteria, Viruses, Mycoplasma and Nematodes. 2.	10	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving• Group discussion• Test• Notes



		Sources of Infection : Seeds, soil, water and airborne diseases of plants; Significance of phylosphere and rhizosphere studies. 3. Pathogenesis - Dissemination of plant pathogens; Mode of infection; Inoculum potential.		
November	Unit – 3	1. Effect of environment on disease development- Predisposing factors; Survival of fungi; Germination of spores; Disease initiation and Epidemics. 2. Host Parasites relationship - Mechanism and physiology of infection, Path of infection, Role of enzymes, growth regulators and toxins in pathogenesis. 3. Physiological specialization : General account; Physiological specialization with special reference to smuts and rusts.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
December	Unit –4	Recurrence of disease with special reference of recurrence of rust disease in India. 2. Methods of Studying Plant Diseases: General account, Macroscopic study, Microscopic study, Koch postulates, Culture technique, Preparation of	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



		culture tubes, media preparation, Inoculation, Isolation, Pure culture, Parasitism of obligate parasites, Methods in bacteriology, Techniques required in introductory bacteriology		
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2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany

Name of Teacher: Akanksha Sahu

Course Type: Theory/Practical/Both

CLASS: M.Sc. 2nd SEM

Course Title: PAPER – I
TAXONOMY AND DIVERSITY OF
PLANTS

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
February	Unit – 1	Plant nomenclature: Historical background of nomenclature, Binomial Nomenclature, International code of Botanical nomenclature. Plant identification: Herbaria, Botanical gardens, Taxonomic literature, Taxonomic-keys. • Taxonomic hierarchy - Major categories, minor categories, species concept. • Taxonomic evidences - Morphology, Anatomy, Palynology, Embryology, Cytology, • Phytochemistry, Genome analysis and Nucleic acid hybridization.	15	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
March	Unit – 2	Pre Darwinian Classification Based on form relationship (Bentham and Hooker) Post Darwinian classification Engler and Prantl, Bessey's, Hutchinson, Takhtajan and • Cronquist. Recent modifications : Dahlgren's system of	10	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



		classification. Fossil angiosperm.		
April	Unit – 3	Study of following families with particular reference to systematic position, phylogeny, evolutionary trends and economic importance. Polypetalae: Ranunculaceae, Magnoliaceae, Nymphaeaceae, Brassicaceae, Sterculiaceae• Meliaceae, Moringaceae, Fabaceae, Myricaceae, Cucurbitaceae, Apiaceae (Umbelliferae), Gamopetalae:Rubiaceae, Asteraceae, Sapotaceae. Oleaceae, Asclepiadaceae, Solanaceae,• Bignoniaceae, Verbenaceae, Lamiaceae (Labiatae),	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
May	Unit –4	Recurrence of disease with special reference of recurrence of rust disease in India. 2. Methods of Studying Plant Diseases: General account, Macroscopic study, Microscopic study, Koch postulates, Culture technique, Preparation of culture tubes, media preparation, Inoculation, Isolation, Pure culture, Parasitism of obligate parasites, Methods in bacteriology, Techniques required in introductory bacteriology	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes

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2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany
Name of Teacher: Praveen Jain
Course Type: Theory/Practical/Both

CLASS: M.Sc. 2nd SEM
Course Title: PAPER – II
MOLECULAR BIOLOGY

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
February	Unit – 1	RNA and DNA Structure. A, B, C and Z Forms of DNA, HnRNA, mRNA, tRNA, rRNA, exon, intron, split gene, junk DNA DNA replication , damage and repair•	15	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
March	Unit – 2	Transcription, translation in prokaryotes and eukaryotes Molecular Cytogenetics : Nuclear DNA content, C-value paradox, Cot curve and its• Significance, Restriction mapping - concept and techniques,• Multigene families and their evolution,•	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
Aprail	Unit – 3	Gene structure and expression: fine structure of gene, Cis-trans test, fine structure analysis of eukaryotes, introns and their significance. RNA splicing, regulation	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



		of gene expression in prokaryotes and eukaryotes. Protein sorting: Targeting of proteins to organelles.●		
May	Unit -4	Mutation: Spontaneous and induced mutation, physical and chemical mutagens molecular basis of gene, transposable elements in prokaryotes and eukaryotes mutation induced by transposones, site directed mutagenesis Inherited human diseases and defects in DNA repair, translocation, intersect Robertsonian translocation, B-Atranslocation.	10	<ul style="list-style-type: none"> ● Use of ICT ● Chalk and talk method ● Problem solving ● Group discussion ● Test ● Notes

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2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany
Name of Teacher: Neha Chandrakar
Course Type: Theory/Practical/Both

CLASS: M.Sc. 2nd SEM
Course Title: PAPER – III PLANT
PHYSIOLOGY

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
February	Unit – 1	Membrane transport and translocation of water and solutes: Plant-water relation, physical and chemical properties of water, imbibition, osmosis, diffusion, DPD, OP, TP, WP, plasmolysis (Incipient, evident and limited), deplasmolysis, mechanism of water transport through Xylem, root microbe interaction in facilitating nutrient uptake. Comparison of xylem and phloem transport, phloem loading and unloading, passive and active solute transport, membrane transport system	15	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
March	Unit – 2	Signal Transduction :Overview, receptors and G proteins, Phospholipids signaling, role of C-AMP, calcium-calmodulin cascade,	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test



		diversity in protein kinases and phosphatases, specific signaling mechanism- two component sensor regulatory system in bacteria.		<ul style="list-style-type: none"> • Notes
Aprail	Unit – 3	Stress physiology :mineral nutrition in plants (excess and deficiency),Plant responses to biotic and abiotic stress, mechanism of biotic and abiotic stress tolerance, HR Fundamental and SAR, water deficit and drought resistance, salinity stress, metal toxicity, freezing and heat stress, oxidative stress.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
May	Unit –4	Sensory photobiology, History of discovery of phytochromes and cryptochromes and their photo chemical and biochemical properties, photophysiology of light under responses,cellular localization, and molecular mechanism of action of enzyme. The flowering process:- Photoperiodism and its significance, endogeneous clock and its• regulation, floral induction and development, Genetic, molecular analysis, role of vernalization.	10	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes

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2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany

Name of Teacher: Akanksha Sahu

Course Type: Theory/Practical/Both

CLASS: M.Sc. 2nd SEM

Course Title: PAPER – IV PLANT
METABOLISM

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
February	Unit – 1	Photosynthesis : General concepts and historical background, evolution of photosynthetic apparatus, photosynthetic pigments and light harvesting complexes, photo oxidation of water, mechanism of electron and proton transport, Carbon assimilation ,the Calvin cycle, photorespiration and its significance, the C4 cycle, the CAM pathway, biosynthesis of starch and sucrose, physiological and ecological considerations.	15	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving• Group discussion• Test• Notes



March	Unit – 2	Respiration and lipid metabolism : Overview of plant respiration, aerobic and anaerobic, glycolysis, Fermentation, Krebs' cycle (TCA cycle), electron transport and ATP synthesis, Pentose phosphate pathway, alternative oxidative system, structure and function of lipids, fatty acid biosynthesis, synthesis of membrane lipids ,structural lipids and storage lipids and their catabolism, Glyoxylate cycle	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
Aprail	Unit – 3	Nitrogen and Sulphur metabolism: Overview, biological nitrogen fixation, nodule formation and nod factors, nif gene, nitrogense, leghaemoglobin, mechanism of nitrate uptake and reduction, ammonium assimilation, sulphur uptake, transport and assimilation.nitrogen cycle, sulphur cycle.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
May	Unit –4	Plant growth regulators and elicitors : Physiological effects and mechanism of action of auxins, gibberellins, cytokinins, ethylenes, abscisic acid, brassinosteroid, polymines ,jasmonic acid and salicylic acid, hormone receptors. Movements in plants- types and its measurement.●	10	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



		Fundamentals of enzymology : Structure and nature of enzymes, inhibitions, General• aspects of allosteric mechanism, regulatory & active sites, isozymes, kinetics of enzymatic catalysis, Michaelis-Menton equation and its significance.		
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DEPARTMENT OF BOTANY

Name of Department: Botany

Name of Teacher: Akanksha Sahu

Course Type: Theory/Practical/Both

CLASS: M.Sc. 4th SEM

Course Title: PAPER –I PLANT REPRODUCTION AND UTILIZATION OF RESOURCES MAX.MA

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
February	Unit – 1	Reproduction :Vegetative reparation, Methods of propagation. Pollination, Pollination - mechanism and vector, Structure of pistil, Pollen stigma interaction, Sporophytic and gametophytic Self-incompatibility (Cytological, biochemical and molecular aspects), Fertilization, double fertilization, in-vitro fertilization.	15	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
March	Unit – 2	Male gametophyte : Structure of anther, Microsporogenesis, Role of tapetum, pollen development, male sterility, sperm dimorphism and hybrid seed production, Pollen germination, Pollen tube growth and guidance, Pollen storage, Pollen allergy, Pollen embryo sac. Female	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



		gametophyte : Ovule development, Organization of embryo sac and Structure of embryo sac cells.		
April	Unit – 3	Seed and Fruit development: Endosperm development during early, maturation and desiccation stages. Embryo genesis, Storage proteins of endosperm, Ultra structure and nuclear cytology, Cell lineage during late embryo development, Polyembryony, Apomixes, Embryo culture, Endospermic and non-endospermic seeds, Dynamics of fruit growth, biochemistry and biology of fruit maturation.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
May	Unit –4	Utilization of resources: Plant used as avenue trees for shade, Pollution control and aesthetics, Innovation for meeting world food demands Origin of Agriculture. Green revolution; benefits and adverse consequences. Ethanobotanically important plants of Chhattisgarh. World centers of primary diversity of domesticated plants.	10	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes

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Govt. C.L.C College Patan, Dist. – Durg
2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany

Name of Teacher: Neha Chandrakar

Course Type: Theory/Practical/Both

CLASS: M.Sc. 4th SEM

Course Title: PAPER –II
POLLUTION AND BIODIVERSITY
CONSERVATION

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
February	Unit – 1	CLIMATE, SOIL AND VEGETATION PATTERNS OF THE WORLD : Life zones, major biomes, major vegetation types and soil types of the world, barren land.	15	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
March	Unit – 2	POLLUTION, CLIMATE CHANGE AND ECOSYSTEMS : Air, water and soil pollution:- kinds, sources, quality parameters, effects on plants and ecosystem. Green house gases (Carbon dioxide, methane, nitrous oxide, Chloro fluorocarbons: sources, trends and role), ozone layer, ozone hole, consequences of climate change) Carbon dioxide fertilization, global warming , sea level rise, UV radiation).	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
April		BIOLOGICAL	20	<ul style="list-style-type: none"> • Use of ICT



	Unit – 3	<p>DIVERSITY :- Concepts and levels, status in India, Utilization and concerns, role of biodiversity in ecosystem functions and stability, speciation and extinction, IUCN categories of threat, distribution and global patterns, terrestrial biodiversity hot spots, inventory. World centers of primary diversity of domesticated plants; The Indo Burmese center, plant introductions and secondary centers.</p>		<ul style="list-style-type: none"> • Chalk and talk method • Problem solving • Group discussion • Test • Notes
May	Unit –4	<p>CONSERVATION STRATEGIES Principles of conservation, extinctions, environmental status of plants based on International union for conservation of Nature. In situ conservation, International efforts and Indian initiatives, protected areas in India- sanctuaries, national parks, biosphere reserves, Wetlands, Mangroves and coral reefs for conservation of wild biodiversity. Ex situ conservation : Principles and practices, botanical gardens, field gene bank, seed banks, in vitro repositories, cryo banks, general account of the activities of Botanical survey of India (BSI),</p>	10	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



		National Bureau of plant genetic resources (NBPGR), Indian council of Agriculture research (ICAR), Council of scientific and Industrial research (CSIR), and the department of Biotechnology (DBT) for conservation and non formal conservation efforts		
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Govt. C.L.C College Patan, Dist. – Durg
2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany
Name of Teacher: Praveen Jain
Course Type: Theory/Practical/Both

CLASS: M.Sc. 4th SEM
Course Title: PAPER –III
BIOTECHNOLOGY-II PLANT CELL,
TISSUE CULTURE AND ORGAN
CULTURE

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
February	Unit – 1	PLANTS CELLS AND TISSUE CULTURE: General introduction, history, scope, concept of cellular differentiation, cellular totipotency. TISSUE CULTURE MEDIA: Introduction, Media constituents, Media selection, Media preparation. CELL CULTURE: Introduction isolation of single cells. Suspension cultures, Culture of Single cell, Plant cell reactors, Applications of cell culture. CLONAL PROPAGATION - Auxiliary bud proliferation, Meristem and shoot tip culture, bud culture. ORGANOGENESIS AND ADVENTIVE EMBRYOGENESIS : Fundamental aspects of morphogenesis; organogenesis via callus formation, direct adventitive	15	<ul style="list-style-type: none">• Use of ICT• Chalk and talk method• Problem solving• Group discussion• Test• Notes



		organ formation		
March	Unit – 2	SOMATIC EMBRYOGENESIS AND ANDROGENESIS : Mechanisms, techniques and utility. SOMATIC HYBRIDIZATION : Methods of Protoplast isolation, Spontaneous and induced methods of protoplasm fusion, identification and selection of hybrid cells. Regeneration of hybrid plants. Verification and Characterization of somatic hybrids, Cybrids, possibilities, achievements and limitations of protoplast research.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
April	Unit – 3	CRYOPRESERVATION AND GERMPLASM STORAGE: Raising sterile tissue cultures, Addition of cryoprotectants and pretreatment, freezing, storage, thawing, determination of survival viability. Plant growth and generation, verification, encapsulation and dehydration. Slow growth method, Applications. INTELLECTUAL PROPERTY RIGHTS : Possible ecological risks and ethical concerns.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
May	Unit –4	APPLICATION OF PLANT TISSUE CULTURE : Artificial seeds, Production of hybrids and soma clones. PRODUCTION OF SECONDARY METABILITIES /	10	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



		<p>NATURAL PRODUCTS : Morphological and chemical differentiations, Medium composition for secondary product formation. Growth production patterns, Environmental factors. Selection of cell lines producing high amounts of a useful metabolite, Problems associated with secondary metabolite production Immobilized cell system.</p> <p>TRANSGENICS IN CROP IMPROVEMENT: Transgenic for Resistance to biotic and abiotic stresses, Transgenes for quality modification, Terminator seed technology. Chloroplast transformation and its utility</p>		
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Govt. C.L.C College Patan, Dist. – Durg
2022-23

DEPARTMENT OF BOTANY

Name of Department: Botany

Name of Teacher: Neha Chandrakar

Course Type: Theory/Practical/Both

CLASS: M.Sc. 4th SEM

Course Title: PAPER –IV
ELECTIVE PAPER– MOLECULAR
PLANT PATHOLOGY

Month	Title unit	Topic of lecture	No. of lectures	Methods of delivery
February	Unit – 1	Epidemiology and disease forecasting: form of epidemics, factors responsible for the establishment of an epidemic, disease forecasting. General principles of plant disease control : General account; Prophylactic. Chemical (including fungicides, systemic fungicides, fumigants, antibiotics, growth regulators etc.) and biological control; Breeding for disease resistance varieties of host plants, Plant quarantine	15	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
March	Unit – 2	Defense Mechanism- Defense of host against pathogen, Structural defense; Physiological defense, Biochemical defense -role of phenolic compounds; Phytoalexins	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



		Defense through hyper-sensitive reactions. 2. Resistance and susceptibility: General account, types of resistance, vertical and horizontal resistance; breeding for disease resistance.		
April	Unit – 3	Wilt diseases: General account, systems of diseases, Mechanism of wilting. 2. Diseases due to fungi: Rusts, smuts, Downy mildews powdery mildew diseases, Wilts, Leaf blight, Ergots, Tikka, necrosis, Rots-red rot of sugarcane, Damping off and warts diseases of economically important plants. 3. Diseases due to Bacteria: Bacterial blight of Rice, Tundu disease, citrus canker, Crown galls of stone fruits, Angular leaf spots.	20	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes
May	Unit –4	Diseases due to Viruses: Mosaic of tobacco, Potato and tomato, Leaf curl of tomato & papaya, Yellow vein mosaic of Bhindi, Bunchy top of banana, Grassy shoot disease of sugarcane. 2. Diseases due to Mycoplasma : Sandal spike, Little leaf of Brinjal, Grassy shoot disease, Sesamum, phyllody, Citrus greening. 3.	10	<ul style="list-style-type: none"> • Use of ICT • Chalk and talk method • Problem solving • Group discussion • Test • Notes



		Diseases due to Nematodes: General characteristics of plants nematodes, Root knot, Malaya disease of Barley, wheat, Citrus nematodes, Ear cockle of wheat		
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