DEPARTMENT OF BOTANY - 2024-25

Academic Planner with unitisation of the entire syllabus (on hourly basis)

DEPARTMENT OF BOTANY					
ACADEMIC PLANNER					
Unitisation of syllabus (SEP)					
I SEMESTER – 2023 -2024					
MONTH	**WEEK**	**UNIT-I**	**UNIT-II**	**UNIT-III**	**UNIT-IV**
		ZNB	ZNB	INDIRA	INDIRA
12 OCT onwards	**1**	Introduction and scope of microbiology. Branches of microbiology-industrial, Medical,Agricultural and environmental Microbiology.		Mycology-General characters and reproduction in fungi. Structure, reproduction and life cycle of Albugo,	
	2week	contributions of scientists to the field of Microbiology – Anton Von Leeuwenhoek,Louis Pasteur, Robert Koch , and Iwanowsky.		Peziza and Puccinia.	
	3week	Microbial culture techniques-Culture media Serial dilution and pure plate method –		Economic importance –Role of fungi in Medicine, Agriculture and Inustry. .	

	4week	VIRUSES – properties, structure of TMV & T4 Bacteriophage, Multiplication (Lytic and Lysogenic cycle) & Transmission of viruses. Tomato leaf disease. Brief account of Prions and Viroids.		Plant Diseases- Tikka disease of Groundnut ,Red rot of Sugrcane, Grain smut of Sorgum and koleroga of Arecanut.	
Nov	1week		Bacteriolgy- Introduction, Classification of Bacteria based on shape and flagella. Ultra structure of bacterial cell with special reference to Gram positive and Gram negative cell wll composisition. Endospore –a bfief account.	LICHENS – General account, reproductio n and ecological importance.	
	2week		Reproduction in bacteria –Binary fission and genetic recombination	A brief account of Mycorrhiza and Biopesticides	Cyanobacteria and Phycology. Cyanobacteria: Introduction, general characteristics,reproduction and economic importance .
	3week		(Transformation,		Type study: Anabaena, Scytonema
	4week		Transduction and Conjugation).		Algae- General charactes, Occurrence, structure, reproduction .life cycle of

Dec	1week		A brief account of Plasmids-definition and properties. Structure and importance of Ti plasmid.		Chlamydomonas,Hydrodictyon
	2week		Bacterial nutrition, Citrus canker disease.		,Spirogyra,Chara,Diatoms,
	3week		Economic importace –Role of bacteria in Agriculture,Medicine and Industry.		saegassum and Polysiphonia.
	4 week		General account of phytoplasma and Sandal spike disease.		Economic importance of algae in industry, agriculture, medicine
DEC	1week				REVISION
	2 week		Revision	Revision	Revision
	3week		Revision	Revision	Revision
	4week	revision	Revision	Revision	Revision

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Unitisation of syllabus (NEP) (on hourly basis)					
III SEMESTER – 2024 -25					
MONTH	**WEEK**	**UNIT-I and UNIT-II**		**UNIT-III and UNIT-IV**	
	1	**Unit 1: ANGIOSPERM ANATOMY, PLANT CELL STRUCTURE AND TISSUES** Introduction,objective and scope of Plant Anatomy	, Plant cell structure	**Unit III: Morphogenesis and Differentiation**	Differentiation and cell polarity in acellular (*Dictyostelium*),
OCTO	**2**	nature of plant cell wall.	***Tissue and tissue systems***	Unicellular (*Acetabularia*)	multicellular system (root hair and stomata formation)
	3	meristematic tissue	permanent tissue and secretary cells.	Shoot Apical meristem (SAM): Origin, structure and function	Cytohistological zonation and Ultrastructure of meristems
	4	Classification of meristem: (apical, intercalary and lateral),	primary and secondary meristem.	Organogenesis: Differentiation of root, stem,	stem, leaf and axillary buds, bud dormancy
	5	***Apical meristem:*** Theories on organization of meristem	(apical cell theory, Tunica-Corpus theory, histogen theory and Korper-Kappe theory),	Mechanism of leaf primordium initiation,	development and Phyllotaxis (Diversity in size and shape of leaves)

	6	quiescent centre, Root cap.	Evolution and concept of organization of shoot apex	Structure and function of root apical meristem (RAM)	Root cap, quiescent centre and origin of lateral roots.
	7	Apical cell theory, Histogen theory	Tunica Corpus theory	Transition from vegetative apex into reproductive apex	Developmental patterns at flowering apex:
	8	continuing meristematic residue	cytohistological zonation	ABC model specification of floral organs.	Modification of gene action by growth hormones and.
	9	**Unit II: MORPHOGENESIS AND DIFFERENTIATION** Morphogenesis in plants	- Differentiation of root, stems and leaf.	cellular differences between floral organs. Senescence – a general account	**Unit IV: Reproductive Biology**
	10	Types of vascular bundles	Vascular cambium, Origin, development	Introduction, Scope and contributions of Indian embryologists: P. Maheswari,	, B G L Swamy, P.Maheshwari, M.S. Swaminathan and K.C. Mehta.
NOV	11	Arrangement and diversity in size and shape of leaves.	Structure of Dicot root	**Microsporangium**: Development and structure of mature anther,	Anther wall layers, Tapetum - types, structure and functions and sprogenous tissue.
	12	primary and secondary structures (Tridax/Sunflower),	Structure of monocot root (Maize).,	**Microsporogenesis** - Microspore mother cells, microspore tetrads, Pollinia.	**Microgametogenesis** – Formation of vegetative and generative cells structure of male gametophyte. Pollen embryosac (Nemec

					phenomenon).
	13	Structure of Dicot stem	Primary and secondary structures (Tridax/Sunflower),	**Megasporangium –** Structure of typical Angiosperm ovule	Types of ovule- Anatropous, Orthotropous, Amphitropous, Circinotropous.
	14	Structure of Monocot stem (Maize), Nodal anatomy.	Structure of Dicot leaf: primary structure (Tridax/Sunflower),	**Megagametogenesis –** Types of development of Female gametophyte/embryo sac- monosporic- *Polygonum* type	bisporic – *Allium* type, tetrasporic - *Fritillaria* type. Structure of mature embryosac.
DEC	15	primary structure of Monocot leaf (Maize),, Stomatal types.	Anomalous secondary growth: Aristolochia, , Boerhaavia (dicot stem)	**Pollination and fertilization:** Structural and functional aspects of pollen, stigma and style. Post	pollination events; Current aspects of fertilization and Significance of double fertilization, Post fertilization changes.
	16	Dracaena (monocot stem)	Applications in systematics, forensics and Pharmacognosy.	**Endosperm** – Types and its biological importance. Free nuclear (*Cocos nucifera*) cellular (*Cucumis),* helobial types. Ruminate endosperm.	**Embryogenesis –** Structure and composition of zygote ,Dicot (*Capsella bursa-pastoris)*and Monocot (*Najas)* embryo development. A general account of seed development.

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V SEMESTER – 2024 –25 PAPER 5					
MONTH	**WEEK**	**UNIT-1**		**UNIT-2**	
		ZNB		**INDIRA**	
OCT	1	**UNIT-1** Mendelian genetics – Introduction ,	Mendelian genetics – Introduction [revision]	**UNIT-2** Linkage, crossing over and chromosome mapping	Linkage and crossing over - Cytological basis of crossing over; Recombination frequency,
	2	Mendelian genetics – History	Mendelian genetics –Laws and concepts	two factor and three factor crosses; Interference and coincidence	Sex Determination in plants - Melandrium
	3	Non-Mendelian genetics - Allelic [introduction]	Non-Mendelian genetics - Allelic (Incomplete Dominance)	Variation in chromosome number and structure	Gene mutations – Types, Molecular basis of Mutations; Mutagens
	4	Non-Mendelian genetics - Allelic [Co-dominance]	Non-Mendelian genetics- non-allelic gene interactions	physical and chemical (Base analogs, deaminating, alkylating and intercalating agents); Detection of mutations	Fine structure of gene

NOV	5	complement ary, supplement ary factors,	dominant and recessive epistasis)	Population Genetics - Allele frequencies, Genotype frequencies, Hardy-Weinberg Law, role of natural selection and mutation	role of natural selection and mutation
	6	Multiple alleles	Extra chromosomal inheritance Chloroplast mutation	Evolutionary Genetics – Genetic drift.	. Genetic variation and Speciation
	7	variegation in Four o'clock plant	Mitochondrial mutations in yeast	**UNIT-4** Quantitative inheritance	Concept, mechanism
	8	**UNIT-3** Plant Breeding: Introduction and objectives.	Breeding systems: modes of reproduction in crop plants.	Examples of inheritance of Kernel colour in Wheat	Monogenic vs Polygenic inheritance.
	9	Important achievemen ts and undesirable consequenc es of plant breeding	Methods of crop improvement	inbreeding depression	heterosis History
	10	Plant introduction	primary and secondary Plant genetic resources - Acclimatization	genetic basis of inbreeding depression	genetic basis of heterosis;
	11	primary and secondary Plant genetic	Selection methods: For self-pollinating	genetic basis of inbreeding depression and heterosis;	Crop improvement and breeding

		resources - Acclimatization		**Applications**	
DEC	12	Selection methods: For cross-pollinating crops	Types of vegetative propagation in plants	Role of mutations	Polyploidy
	13	Hybridization – Types, Procedure.	Hybridization – advantages and limitations.	Distant hybridization	role of biotechnology in crop improvement.

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Unitisation of syllabus(NEP)					
V SEMESTER – 2024 –25 PAPER 6					
MONTH	**WEEK**	**UNIT-1**		**UNIT-2**	
		ZNB		**INDIRA**	
OCT	1	**UNIT-1** Morphology of Root, Stem and Leaf.	Their modifications for various functions.	**UNIT-2** Plant identification: Taxonomic dichotomous keys;	intended (yolked) and bracketed keys. (Brief account only). frequency,
	2	Inflorescence – types.	Fruits–types.	Plant descriptions: Common Terminologies used for description of vegetative	reproductive parts of the following families
	3	Structure of Flower - Floral diagram and floral formula.	Introduction to Taxonomy: History,	Study of the diagnostic features of Angiosperm families: Annonaceae,	Study of the diagnostic features of Angiosperm families: Brassicaceae
	4	objectives, scope and relevance of Taxonomy	Systems of classification: Artificial, Natural and Phylogenetic;	Rutaceae, Fabaceae (Papilionoideae, Ceasalpinoideae and Mimosaideae)	Cucurbitaceae, Apiaceae,

NOV	5	brief account of Linnaeus', Bentham & Hooker's, Engler and Prantl's system and APG IV System (2016) - Merits and demerits of classifications	Taxonomic literature: Floras, Monographs and Journals.	Rubiaceae, Asteraceae,	Lamiaceae, Euphorbiaceae,
	6	Herbaria and Botanical gardens: Important herbaria and botanical gardens of the world	Important herbaria and botanical gardens of the world. (Royal Botanical Garden, Kew, England) and India (National Botanical Garden, Calcutta).	Orchidaceae, Commelinaceae, and Poaceae.	Plant Taxonomic Evidences: from palynology,
	7	Role of botanical gardens. Technique of Herbarium Preparation	Virtual herbarium: E-flora; Documentation.	Plant Taxonomic Evidences: from , embryology,	Plant Taxonomic Evidences: from cytology, phytochemistry and molecular data.
	8	**UNIT-3** Taxonomic Hierarchy:	Concept of taxa (family, genus, species);	**UNIT-4** Biometrics, Numerical Taxonomy; Phenetics and Cladistics:	Characters; Variations;
DEC	9	taxonomic hierarchy;	Species concepts (biological, morphological and evolutionary)	OTUs, character weighting and coding;	Cluster analysis;

	10	Rank less system of phylogenetic systematics	Botanical Nomenclature:	Phenograms,	cladograms (definitions and differences)
	11	Botanical Nomenclature: Principles and rules (ICN);	Latest code –brief account, Brief account of Ranks of taxa	Phylogenetic Systematics: Terms and concepts (primitive and advanced, homology and analogy, parallelism and convergence....	monophyly, Paraphyly, polyphyly, clades, synapomorphy, symplesiomorphy, apomorphy, lineage sorting, serial homology etc.)
	12	Type concept (Typification), Rule of priority,	effective and valid publication	Origin and evolution of angiosperms;	Co-evolution of angiosperms and animals;
	13	Author citation., rejection of names,	Nomenclature of hybrids/cultivated species	Methods of illustrating evolutionary relationship (phylogenetic tree, cladogram)	Molecular taxonomy: DNA sequences of chloroplast gene (rbcL)