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)					
II SEMESTER – 2024 -2025					
MONTH	**WEEK**	**UNIT-I**	**UNIT-II**	**UNIT-III**	**UNIT-IV**
		ZNB/HM UNIT 3 PTERIDOPHYTES (15Hrs)	**ZNB UNIT 4 PALEOBOTANY (15 Hrs)**	**MLI BRYOPHYTES (15 Hrs)**	**MLI/HM UNIT 4 MERISTEMATIC TISSUES(15Hrs)**
	1	Introduction and general characters of Pteridophytes.		General characters, classification of Bryophytes.	
	2week	Study of diversity in morphology, anatomy, reproduction and life cycle (Developmental stages not required) of the following groups in representative forms: 1. Psilotopsida – Ex. Psilotum		Distribution, structure, reproduction and alternation of generations in Bryophytes.	
	3week	2. Lycopsida – Ex. LycopodiumandSelaginella.		structure, reproduction and alternation of generations in Marchantia,.	
	4week	3. Filicopsida - Ex. Marsilea		structure, reproduction and alternation of generations in Anthoceros	
MARCH	**1week**	Brief account of stelar evolution.		structure, reproduction and alternation of generations in Funaria.	

	2week	heterospory and seed habit.		Ecological and economic importance of Bryophytes.	
	3week		Contributions of paleobotanist – BirbalSahni. Outline of geological time scale.		- Structure, function and classification of Meristematic Tissues .
	4week		geological time scale with special emphasis on Paleozoic and Mesozoic Era.		Organisation of Apical Meristems: Apical cell theory of Shoot and root apical meristems.
APRIL	**1week**		Process of fossilization – Compression, Impression, Petrifaction.		Tunica-corpus theory and Histogen theory of Shoot and root apical meristems.
	2week		Compaction, Casts and Moulds, Coal balls.		Histology: Structure, Classification and significance of simple, tissues..
	3week		Type study – Rhynia,		Structure, Classification and significance of complex and secretory
	4 week		Type study – Cycadeoidea		Types of vascular bundles. Secondary growth: Dicot stem. Ex. –Tridax
MAY	**1week**		Type study – Pentaxylon.		Anomalous Secondary growth: Boerhaaviaand Dracaena. Brief account of wood anatomy.
	2 week	Revision	Revision	Revision	Revision
	3week	Revision	Revision	Revision	Revision
	4week	Revision	Revision	Revision	Revision

DEPARTMENT OF BOTANY					
ACADEMIC PLANNER					
Unitisation of syllabus (NEP) (on hourly basis)					
IV SEMESTER – 2024 -25					
MONTH	**WEEK**	**UNIT-III and UNIT-IV ZNB/HM**		**UNIT-I and UNIT-II INDIRA/HM**	
		Unit 4: PHYTOGEOGRAPHY AND ENVIRONMENTAL ISSUES (14 Hrs)	**Unit 4: BIODIVERSITY AND ITS CONSERVATION (14 Hrs)**	**Unit 1: INTRODUCTION TO ECOLOGY AND CONSERVATION BIOLOGY (14 Hrs)**	**Unit 2: COSYSTEM ECOLOGY: (14 Hrs)**
FEB	**1**	Theory of continental drift. Centres of origin of crop plants – Vavilov's concepts. Phytogeographical regions of India.		Definition, Principles of Ecology, Brief history. Major Indian Contributions, Scope and importance.	
	2	Vegetation types of Karnataka – Composition and distribution of evergreen, semi- evergreen, deciduous, scrub, mangroves, shola forests and grasslands.		Ecological factors: Climatic factors: light, temperature.	
	3	An account of the vegetation of the		Ecological factors: precipitation and	

		Western Ghats of Karnataka.		humidity. Edaphic factors: Soil and its types. soil texture, soil profile, soil formation;	
	4	Pollution: Water pollution: Types, causes and effects; water quality indicators, water quality standards in India and control of water pollution (Waste water treatment).		physico-chemical properties of soil - mineral particles, soil pH, soil aeration, organic matter, soil humus and soil microorganisms.	
MARCH	**5**	Water pollution disasters – National mission on clean Ganga, Handigudu and Minimata		Topographic Factors: Altitude. Ecological groups of plants and their adaptations: Morphological and anatomical adaptations of hydrophytes,xerophytes, epiphytes. And halophytes.	
	6	Air pollution: Causes, effects, air quality standards, acid rain and control. Soil pollution: Causes, effects, solid waste management and control measures of soil pollution.			Introduction, types, Biotic and Abiotic components and structure of ecosystems with examples - terrestrial
	7		Biodiversity:		Introduction, types,

			Definition, types of biodiversity - habitat diversity, species diversity and genetic diversity,		Biotic and Abiotic components and structure of ecosystems with examples – Aquatic.
	8		Sustainable Development Goals (SDG's) in biodiversity conservation.		Ecosystem functions and processes: Food chain and Food web.
APRIL	9		Values of Biodiversity – Economic and aesthetic value, Medicinal and timber yielding plants.		Ecological pyramids – Pyramids of number, energy and biomass. Energy flow in ecosystem.
	10		NTFP. Threats to biodiversity. Concept of Biodiversity hotspots. Concept of endemism and endemic species.		Ecological succession: Definition, types primary and secondary. General
	11		ICUN plant categories with special reference to Karnataka/ Western Ghats.		stages of succession. Hydrosere and xerosere.
	12		Conservation methods – In-situ and ex-situ conservation		Community Ecology: Community and its characteristics – frequency, density, Abundance, cover

					and basal area, phenology, stratifications, life-forms
MAY	**13**		In-situ methods – Biosphere reserves, National parks, Sanctuaries and Sacred grooves.		. Concept of Ecotone and Ecotypes. Intra-specific and Inter-specific interactions with examples.
	14		Ex-situ methods- Botanical gardens, Seed bank, Gene bank and Pollen bank Cryopreservation		Ecological methods and techniques: Methods of sampling plant communities – transects and quadrat. Remote sensing as a tool for vegetation analysis, land use –land cover mapping.
	15	REVISION	REVISION	REVISION	REVISION
	16	REVISION	REVISION	REVISION	REVISION

DEPARTMENT OF BOTANY					
ACADEMIC PLANNER					
Unitisation of syllabus(NEP)					
VI SEMESTER – 2024 –25 PAPER 7					
MONTH	**WEEK**	**UNIT-1**	**UNIT-2**	**UNIT-3**	**UNIT-4**
		MLI	**ZNB**	**HM**	**MLI**
		Plant water relations	Photosynthesis	plant growth regulators	Carbohydrate metabolism
FRB	1	Plant water relations: Importance of Water as a solvent, Diffusion, osmosis, imbibition, osmotic potential, turgor pressure, wall pressure, water potential and its components.		Definition and classification of plant growth regulators – Hormones, site of synthesis, and influence on plant growth and development of individual group of hormones - Auxins,	
	2	Mechanism of water absorption, Factors affecting water absorption. Transpiration: Types, Stomatal apparatus and mechanism of stomatal movement.		Gibberellins, cytokinins, ABA and ethylene Synthetic growth regulators - Classification, their effect on plant growth and development..	
	3	Antitranspirants. Mechanism of ascent of sap:		Practical utility in agriculture and	

		Vital and physical force theories.		horticulture.	
	4	Phloem Transport: Transport of organic solutes. Path of transport, vein loading and		Sensory Photobiology - Biological clocks, photoperiodism Senescence - Aging and Cell Death (PCD and Autophagosis).	
MARCH	5	unloading. Transcellular hypothesis and mass flow hypothesis		, function & structure of phytochromes, phototropin and cryptochrome	
	6	Mineral nutrition: A brief account on Micro and macro nutrients.		Plant Movements – Tropisms	
	7		Photosynthesis: Photosynthetic pigments (Chl a, b, Xanthophylls and Carotene)		Carbohydrate metabolism – Cellulose and starch – structure and function.
	8		Photosystem I and II, reaction center, antenna molecules;		Enzymes - Classification, kinetics and mechanism of action.
APRIL	9		Electron transport and mechanism of ATP synthesis		Proteins - Classification, structure - primary, secondary, tertiary and quaternary.
	10		; C3, C4 and CAM pathways of carbon fixation;		and their role in plants Amino acids

	11		Photorespiration. Respiration: Glycolysis		– A brief account. Vitamins -.
	12	8	TCA cycle; Oxidative phosphorylation and		Classification, distribution and function. Lipids - containing compounds
	13		, Anaerobic respiration Nitrogen metabolism:		Classification, structure and function of fatty acids
	14		Biological nitrogen fixation; Nitrate and ammonia assimilation		Secondary plant products: Distribution of terpenes, phenolics and nitrogen
MAY	15	REVISION	REVISION	REVISION	REVISION
	16	REVISION	REVISION	REVISION	REVISION

DEPARTMENT OF BOTANY					
ACADEMIC PLANNER					
Unitisation of syllabus(NEP)					
VI SEMESTER – 2024 –25 PAPER 8					
MONTH	**WEEK**	**UNIT-3**	**UNIT-4**	**UNIT-1**	**UNIT-2**
		ZNB		**MLI**	
		Molecular Biology	Gene concept,	**Plant cell**	Chromosome Biology
FEB	1	**Molecular Biology – Historical perspectives, DNA is the genetic material (Griffith's, Harshey and Chase experiments)**		**Plant cell – Ultrastructure and its components Cell wall – Types,**	
	2	**Nucleic acids – DNA structure, composition, types and**		**composition and functions Biological membranes – Types, composition and transport**	
	3	**the mechanism of replication A brief account of DNA repair mechanism**		**Plasma membrane, nuclear membrane and E R membrane**	
	4	**RNA – Structure, composition and types Central dogma of Molecular biology,**		**Plant cell organelles – Structure and function (Nucleus,**	

MARCH	5	**genetic code – Salient features**		**Vacuole, mitochondrion**	
	6	**Gene expression in prokaryotes (Transcription and translation)**		**and chloroplast) Cytoskeleton**	
	7		Gene concept,		Chromosome Biology – Types and structural organization of eukaryotic chromosomes (up to nucleosome modelcheck points and role of protein kinases–
	8		Genomics and proteomics Gene regulation-–		) Types of Chromosomes – Normal,
	9		Lac operon concept		giant and
	10		Epigenetics		supernumerary
	11		Gene editing, DNA methylation, Sn/mi RNAs and Ribozymes–		chromosomes Cell cycle – Phases of eukaryotic cell cycle,
	12		Genomic organization in Eukaryotes		Cell division – Mitosis and
	13		Recombinant DNA technology		meiosis and its significance Karyotype
	14		A brief account Introduction to Bioinformatics and its applications		Types and significance. Programmed cell death (PCD).
	15	REVISION	REVISION	REVISION	REVISION
	16	REVISION	REVISION	REVISION	REVISION

B. Sc. BOTANY – VI Semester

PLANT PHYSIOLOGY AND PLANT BIOCHEMISTRY (THEORY)

Contents	56 Hrs
UNIT 1	**14 hrs**
Plant water relations: Importance of Water as a solvent, Diffusion, osmosis, imbibition, osmotic potential, turgor pressure, wall pressure, water potential and its components. Mechanism of water absorption, Factors affecting water absorption. **Transpiration:** Types, Stomatal apparatus and mechanism of stomatal movement. Antitranspirants. **Mechanism of ascent of sap:** Vital and physical force theories. **Phloem Transport:** Transport of organic solutes. Path of transport, vein loading and unloading. Transcellular hypothesis and mass flow hypothesis. **Mineral nutrition:** A brief account on Micro and macro nutrients.	
UNIT 2	**14 hrs**
Photosynthesis: Photosynthetic pigments (Chl a, b, Xanthophylls and Carotene) Photosystem I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C3, C4 and CAM pathways of carbon fixation; Photorespiration. **Respiration:** Glycolysis, TCA cycle; Oxidative phosphorylation and Anaerobic respiration **Nitrogen metabolism:** Biological nitrogen fixation; Nitrate and ammonia assimilation.	

UNIT 3	14 hrs
Definition and classification of plant growth regulators – Hormones, site of synthesis, and influence on plant growth and development of individual group of hormones - Auxins, Gibberellins, cytokinins, ABA and ethylene **Synthetic growth regulators** - Classification, their effect on plant growth and development. Practical utility in agriculture and horticulture. **Sensory Photobiology** - Biological clocks, photoperiodism, function & structure of phytochromes, phototropin and cryptochrome. Senescence - Aging and Cell Death (PCD and Autophagosis). Plant Movements – Tropisms	

UNIT 4	14 hrs
Carbohydrate metabolism – Cellulose and starch – structure and function. **Enzymes** - Classification, kinetics and mechanism of action. **Proteins** - Classification, structure - primary, secondary, tertiary and quaternary. Amino acids – A brief account.	
Vitamins - Classification, distribution and function. **Lipids** - Classification, structure and function of fatty acids. **Secondary plant products**: Distribution of terpenes, phenolics and nitrogen containing compounds and their role in plants	

DEPARTMENT OF BOTANY

ACADEMIC PLANNER 2024 –25

Unitisation of syllabus (NEP & SEP)

II SEMESTER (SEP) –PAPER 2

IV SEMESTER (NEP) –PAPER 4

VI SEMESTER (NEP) –PAPER 7

VI SEMESTER (NEP) –PAPER 8