DEPARTMENT OF BOTANY -2022-2023

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

DEPARTMENT OF BOTANY					
ACADEMIC PLANNER					
Unitisation of syllabus					
I SEMESTER – 2021 -2022					
MONTH	**WEEK**	**UNIT-I**	**UNIT-II**	**UNIT-III**	**UNIT-IV**
		RV	ZNB	ZNB	RV
12 october onwards	1	Introduction to microbial diversity ; methods of estimation ; Hierarchial organisations and positions of microbes in the living world . Whittakers's five kingdom system and carl Richard Woese's three domain system . Distribution of microbes in soil , air,food and water . Significance of microbial diversity in nature .	Culture media for microbes – Natural and synthetic media , Routine media – basal media , enriched media , selective media , indicator media , transport media and storage media	Microbial cultures and preservation – Microbial cultures . Pure culture and axenic cultures , subculturing , preservation methods overlaying cultures with mineral oils , lyophilisation . Microbial culture collections and their importance . A brief account on ITCC , MTCC and ATCC.	**BACTERIA –** general characteristics and classification . Archaebacteria and Eubactyeria . Ultrastructure of bacteria ; bacteria growth and nutrition . Reproduction in bacteria – asexual ad sexual methods . study of rhizobium and its aplications . A brief account of actinomycetes and cyanobacteria . Mycoplasms and phytoplasmas – General charcteristics and diseases . economic importance of bacteria

2week	**HI** Whittakers's five kingdom system and carl Richard Woese's three domain system . Distribution of microbes in soil , air,food and water . Significance of microbial diversity in nature **STORY AND DEVELOPMENT OF MICROBIOLOGY** : microbiologists and their contributions	Sterilization methods : Principle of disinfection , antiseptic , tyndalisation and pasteurization , sterilization by dry heat , moist heat , UV light , Ionization radiation , filtration . Chemical methods of sterilization – phenolics compounds , anionic and cationic detergents	VIRUSES – general structure and classification of viruses ; ICTV system of classification , structure and multiplication of TMV , SARS-COV-2, and bacteriophage (T2) , Cultivation of viruses , vaccines and types.	**FUNGI -** genral charcteristics and classification . Thallus organisation and nutrition in fungi . Reproduction in fungi , Heterothallism and parasexuality . Type study of phytophthora , rhizopus , Neurospora , Puccinia, Pencillium and Trichoderma
3week	Microscopy working and applications of light , dark field , phase contrast and electron microscopes . Microbiological stains (acidic , basics and special) and principles of staining . Simple , Gram's and differential staining .	Microbial growth – Microbial growth and measurement , Nutritional types of microbes – autotrophs and heterotrophs , phototrophs and chemotrophs .lithotrophs and organotrophs	VIROIDS – general characteristics and structure of potato spindle tuber viroid (PSTVd) ; prions – general characters and prion diseases , Economic importance of viruses	**LICHENS** – structure and reproduction . VAM fungi and their significance . Fungal diseases – Late blight of potato , Black stem rust of wheat ; Downy mildew of bajra , Grain smut of sorghum , Sandal spike , citrus canker , Root Knot disease of mulberry , economic importance of fungi .

	4week	Contribution of Luis Pasteur	Reproduction in bacteria	economic importance of Cyanobacteria, SCP,	Hydrodictyon reproduction
Nov	1week	Robert Koch and Alexander Flemming	Reproduction in bacteria	Biofertilizers, role in water pollution and treatment.	Oedogonium – vegetative structure
	2week	Isolation of microbes from soil – Culture media	Economic importance of bacteria	Type study: Anabaena, Spirulina,	Oedogonium- Reproduction
	3week	Serial dilution and pore plate method – colony characterisitcs of bacteria	Bacterial disease	Type study: Spirulina,	Chara – Vegetativestructure Reproduction
	4week	Applied microbiology	General account of mycoplasma	Scytonema	Sargassum – structure and reproduction
Dec	1week	Bioconversions of waste products	General account of mycoplasma	Phycology-Part-I: Introduction, general characteristics outlines of classification (Fritsch – 1947	Sargassum – Reproduction
	2week	A brief history of virology (scientist)	Introduction to immunology	, thallus structure, pigmentation	Polysiphonia – Structure and male gametophyte
	3week	General composition and properties of	Brief account of immune system	reproduction .	Polysiphonia- female

		viruses			gametophyte
	4 week	TMV and bacteriophage	Application of immune techniques	. Economic importance of algae in industry, agriculture, medicine	Polysiphonia – Carposporophyte and tetrasporophyte
JAN	1week	Multiplication and transmission – a brief account of prions and viroids. Common plant diseases.	Monoclonal antibodies .	Toxic algae – Algal blooms, fish poisoning.	REVISION
	2 week	Multiplication and transmission – a brief account of prions	Revision	Revision	Revision
	3week	Viroids	Revision	Revision	Revision
	4week	revision	Revision	Revision	Revision

FEB	1week	. Common plant diseases.	Monoclonal antibodies . Monoclonal antibodies	Toxic algae – Algal blooms, fish poisoning.	REVISION
	2week	Revision	Revision	Revision	Revision
	3week	-----	-----	-----	-----
	4week	-----	-----	-----	-----

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ACADEMIC PLANNER					
Unitisation of syllabus					
III SEMESTER – 2022 -2023					
MONTH	**WEEK**	**UNIT-I**	**UNIT-II**	**UNIT-III**	**UNIT-IV**
JULY	**1**	General characters	Introduction to paleo botany	Edaphic factors – soil formation, soil profile	____
	2	Psilotum - morphology	Importance of paleo botany	Soil air, soil microorganisms, soil errosion and conservation	introduction to ecosystem management
	3	Psilotum TS of stem and rhizome,gametophyte	Contributions of Birbal Sahani, an account of his work	Contour farming, mulching, strip cropping, terracing, crop rotation	Watershed management
	4	Lycopodium- morphology and stem anatomy	Geological time scale – introduction	Mechanical conservation, soil reclamations	Conservation of natural resources
AUGUST	**5**	Lycopodium - gametophytes	Paleozoic era	Biotic factors	Over exploitation of natural resources
	6	Selaginella – morphology amd stem anatomy	GTS – Mesozoic era	Ecosystem – concept and components	Afforestation, Social forestry and agroforestry
	7	Selaginella - reproduction	Introduction to fossils	Study of marine and grassland, cropland	Conservation of plant diversity

	8	Marsilea-morphology	Types of fossils	Ecological succession	insitu and exsitu conservation
SEPTEMBER	**9**	Marsilea -anatomy	Process of fossilazation,	Ecological adaptations	National parks
	10	Marselia - sporocarps	Types of fossilazation	Hydrophytes and Xerophytes	Sanctuaries and bioreserves
	11	Marselia - Reproduction	Rhynia	Halophytes, Epiphytes and Parasites	Role of seed Bank and gene bank
	12	Stelar Evolution	Cycadeoidea,		Introduction to phytogeography
OCTOBER	**13**	Stelar evolution. Heterospory and seed Habit.	Pentaxylon		Phytogeographical regions of India . Vegetational types of karnataka
	14	Revision	Revision	Revision	Revision
	15	Revision	Revision	Revision	Revision
	16	Revision	Revision	Revision	Revision

V –SEMESTER

PAPER V

DEPARTMENT OF BOTANY			
ACADEMIC PLANNER 2022-23			
WEEK	**OCT-NOV**	**NOV-DEC**	**JAN-FEB**
	KSS	**KSS**	**KSS**
1	Aim and Scope of taxonomy, Brief History,	Dicotyledoneae - Magnoliaceae, Annonaceae,	Ethnobotany: A general account
2	Broad outline of classification proposed by Bentham &Hooker,	Brassicaceae,	ECONOMIC BOTANY: Edible oils: Groundnut, Coconut & Sesamum
3	Broad outline of classification proposed by Engler &Prantl- merits and demerits.	Rutaceae,	Sugar and Starch: Sugarcane, Beetroot, Potato & Tapioca
4	Species concept: Taxonomic hierarchy, species, genus and family.	Rosaceae	Fibers: Cotton, Jute & Coir
5	Biosystematics: Plant nomenclature, Binomial system, ICBN- rules for nomenclature	Euphorbiaceae	Paper & Pulp: Bamboo & Eucalyptus
6	Taxonomic Tools,	Apiaceae	Beverages: Coffee, Tea &Cocoa
7	Herbarium and its techniques	Metachlamydeae - Cucurbitaceae,	Spices: Ginger, Cardamom, Clove,
8	Floras and their importance,	, Asteraceae	Cinnamon, Asafoetida, Turmeric Saffron & Nutmeg
9	Botanical gardens and their importance- State: Lalbagh,	Asclepiadaceae,	Timber: Teak & Rose wood

10	National: Indian Botanical garden Sibpur,	& Lamiaceae	Medicinal & Aromatic: Ashwagandha, Aloe vera
11	Calcutta, International: Royal Botanical garden, Kew, England	Monocotyledoneae-Poaceae,	Indian Pennywort, Holy Basil, Amla
12	Chemotaxonomy, Cytotaxonomy,	Orchidaceae	Periwinkle, Margosa tree
13	Numerical taxonomy & application of computer	revision	Patchouli, Mint, & Lavender

V-SEMESTER
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DEPARTMENT OF BOTANY			
ACADEMIC PLANNER 2022-23			
WEEK	**OCT-NOV**	**NOV-DEC**	**JAN-FEB**
	RV	ZNB	**ZNB**
1	A brief account of Ascent of sap	Water relations in plants	Molecular biology – introduction and discovery of genetic material
2	vital and physical force theories	Importance of water, osmosis diffusion, imbibition	Chemical nature and structure of DNA
3	Transpiration – definition, types	Water potential	DNA replication
4	Mechanism of transpiration	Absorption of water	Genetic code
5	Stomatal structure and mechanism	Passive absorption	RNA types
6	Significance of transpiration	Factors affecting absorption of water	Protein synthesis
7	Factors affecting transpiration	Water and salt stress	Gene regulation – Lac operon concept
8	Anti-transpirants, guttation	Heat stress	Introduction to

			genetic engineering
9	Mineral nutrition-introduction	Use of microbes in industry and agriculture	Recombinant DNA technology
10	Major and minor elements, Importance, deficiency of mineral nutrition	Production of ethanol	Genomic libraries, application of genetic engineering in agriculture
11	Transport of organic solutes – path of transport	Production of antibiotics	Hazards and safeguards of genetic engineering
12	Vein loading and unloading. Streaming hypothesis	Production of Penicillin	A brief account of genetic engineering with reference to Bt cotton
13	Mass flow hypothesis. Source – sink concept	Use of microbes in fermentation	A brief account of bioinformatics and its uses