



Radhey Hari Govt. P. G. College, Kashipur, Uttarakhand

**Department of Botany**

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**Teaching Plan**  
**(2023 -24)**

TEACHING PLAN-DEPARTMENT OF BOTANY

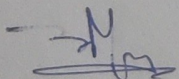
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SEMESTER: 2nd

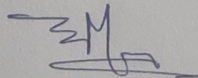
SESSION: 2023-24

NAME OF PAPER: **BOT201T**: Pteridophytes, Gymnosperms and Angiosperms


MONTH	WEEK ordinal	Topic Alloted: Pteridophytes	NO OF LECTURES	REMARKS
Jan	2	General characteristics: Vegetative	1	
	3	General characteristics: Reproductive	1	
	4	Classification and phylogeny	1	
Feb	1	Rhynia	1	
	2	Selaginella: morphology & anatomy	1	
	3	Selaginella: Reproduction	1	
	4	Selaginella: Development of antheridia, Archegonia & zygote	1	
March	1	Equisetum: Morphology & Anatomy	1	
	2	Equisetum: Reproduction	1	
	3	Pteris: Morphology & Anatomy	1	
	4	Pteris: Reproduction	1	
April	1	Heterospoy and Seed Habit	1	
	2	Stelar System	1	
	3	Ecological and economic importance	1	
	4	Telome theory	1	



Aditya Kr Maurya



HOD's Signature



Principal

## TEACHING PLAN-DEPARTMENT OF BOTANY

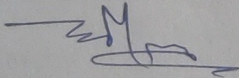
CLASS: M. Sc.

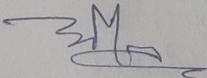
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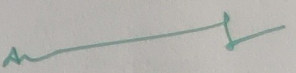
SESSION: 2023-24

NAME OF PAPER: BOT/II/CC/06: Gymnosperms

MONTH	WEEK ordinal	Topic allotted: Gymnosperms	NO OF LECTURES	REMARKS
Jan	2	Introduction: History, distribution and evolution	4	
	3	Classification	4	
	4	Pteridospermales (Lyginopteridaceae, Medullosaceae)	4	
Feb	1	Pteridospermales (Caytoniaceae and Glossopteridaceae)	4	
	2	General account of Cycadeoideales	4	
	3	General account of Cordaitales	4	
	4	General account of Pentoxylales	4	
March	1	Morphology, anatomy and reproduction in Cycadales	4	
	2	Morphology, anatomy and reproduction in Ginkgoales	4	
	3	Morphology, anatomy and reproduction in Coniferales	4	
	4	General account of Ephedrales	4	
April	1	General account of Welwitschiales	4	
	2	General account of Gnetales	4	
	3	Fossils, their Types & fossilization	4	
	4	Gondwana flora	4	

  
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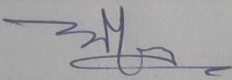
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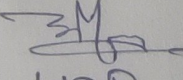
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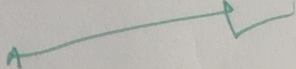
SESSION: 2023-24

NAME OF PAPER: **BOT/IV/EC/16 (iii): Taxonomy of Angiosperms**

MONTH	WEEK ordinal	Topic Alloted: Taxonomy	NO OF LECTURES	REMARKS
Jan	2	History of different systems of classification (introduction only).	4	
	3	Systems of classification- Benthom and Hooker	4	
	4	Systems of classification- Hutchinson & A. Takhtajan	4	
Feb	1	Systems of classification- A. Cronquist & Robert Thorne	4	
	2	Taxonomic evidences- wood anatomy, embryology & palynology	4	
	3	Taxonomic evidences- cytotaxonomy, chemotaxonomy	4	
	4	Taxonomic evidences- biosystematics and numerical taxonomy.	4	
March	1	Cladistics in taxonomy, relevance of taxonomy to conservation.	4	
	2	Magnoliaceae, Myrtaceae	4	
	3	Cannabaceae, Primulaceae,	4	
	4	Cucurbitaceae	4	
April	1	Scrophulariaceae, Verbinaceae,	4	
	2	Lauranthaceae & Fagaceae	4	
	3	Orchidaceae, Poaceae.	4	
	4	Wild and cultivated fruits of Kumaun	4	

  
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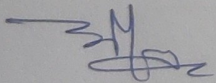
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SEMESTER: 1st

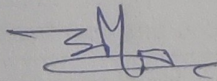
SESSION: 2023-24

NAME OF PAPER: **BOT101T**: Microbes, Algae, Fungi and Bryophytes

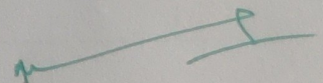
MONTH	WEEK ordinal	Topic Alloted: Bryophytes	NO OF LECTURES	REMARKS
AUG	1	Introduction to Bryophytes: Habit, Habitat	1	
	2	Introduction to Bryophytes: Ecology	1	
	3	General characteristics- Vegetative	1	
	4	General characteristics- Reproductive	1	
SEPT	1	Habit	1	
	2	Habitat	1	
	3	Classification- introduction	1	
	4	Classification	1	
OCT	1	Marchantia- Morphology & Anatomy	1	
	2	Marchantia- Reproduction	1	
	3	Anthoceros- Morphology & Anatomy	1	
	4	Anthoceros- Reproduction	1	
NOV	1	Funaria- Morphology & Anatomy	1	
	2	Funaria- Reproduction	1	
	3	Economic importance of bryophytes.	1	



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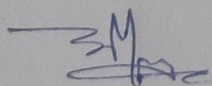
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Year: 3rd

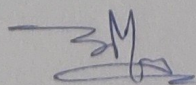
SESSION: 2023-24

NAME OF PAPER: (Paper II) Ecology, Bio-Statistics and Economic Botany

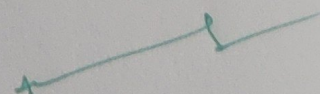
MONTH	WEEK ordinal	Topic allotted: Ecology	NO OF LECTURES	REMARKS
Aug	1	General concept of Ecology	1	
	2	Environmental & its Principle	1	
	3	Principles of environment	1	
	4	Atmosphere as a Factor	1	
Sept	1	Atmosphere as a Factor	1	
	2	Light as a Factor, (heliophytes and sciophytes)	1	
	3	Temperature as a Factor, (thermoperiodism and vernalization)	1	
	4	Water as a Factor	1	
Oct	1	Soil as a Factor	1	
	2	Responses of plants to water (Hydrophytes)	1	
	3	Responses of plants to water (Xerophytes)	1	
	4	Population: Growth curves.	1	
Nov	1	Ecotype and ecads.	1	
	2	Community ecology and its Structure	1	
	3	Attributes of community	1	
	4	Life forms and biological spectrum	1	
Dec	1	Ecological succession	1	
	2	Ecosystem concept	1	
	3	Food chain, food web and ecological pyramids	1	
	4	Eenergy flow in ecosystem	1	
Jan	2	Biogeochemical cycles	1	
	3	Nitrogen cycles	1	
	4	Phosphorus cycles	1	
Feb	1	Environmental pollution	1	
	2	Air pollution	1	
	3	Soil & Water pollution	1	
	4	Noise Pollution	1	
Mar	1	Radioactive pollution	1	
	2	Global Warming & Green House Gases	1	
	3	Ozone layer, Significance.	1	



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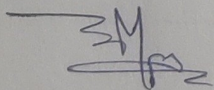
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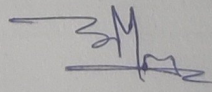
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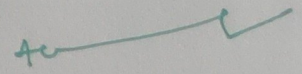
SESSION: 2023-24

NAME OF PAPER: (BOT/I/CC/04): **Bryophyta and Pteridophyta**

MONTH	WEEK ordinal	Topic allotted: <b>Bryophytes</b>	NO OF LECTURES	REMARKS
AUG	1	Bryophytes, affinities & Evolutionary Trends.	4	
	2	Bryology in India.	4	
	3	General idea about morphology & cytology in Bryophytes	4	
	4	Reproduction in Bryophyta.	4	
SEPT	1	Modern Systems of Classification of Bryophytes.	4	
	2	Ecological and Economic Importance of bryophytes	4	
	3	Role of bryophytes in monitoring mineral deposition and as indicator of air pollution.	4	
	4	Sphaerocarpales- Sphaerocarpos	4	
OCT	1	Marchantia, Lunularia, Plagiochasma, Reboulia,	4	
	2	Asterella, Cryptomitrium, Targionia, Conocephalum, Cyathodium	4	
	3	Frullania, Porella, Radula, Haplomitrium	4	
	4	Pellia, Sewardiella, Metzgeria, Riccardia	4	
NOV	1	Anthoceros, Foilioceros, Megaceros, Phaeoceros, Notothylas	4	
	2	Sphagnum, Andreaea, Takakia,	4	
	3	Buxbaumia, Polytrichum	4	

  
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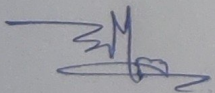
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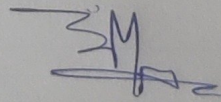
SESSION: 2023-24

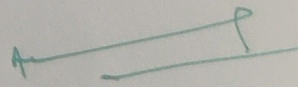
CLASS: M. Sc.

NAME OF PAPER: BOT/III/CC/11: Plant Ecology

MONTH	WEEK ordinal	Topic Alloted: Plant Ecology	NO OF LECTURES	REMARKS
August	1	Climate, soil and vegetation patterns of the world	4	
	2	Major terrestrial biomes	4	
	3	Vegetation Types and environmental factors.	4	
	4	Vegetation organization : Concepts of community and continuum	4	
September	1	Community structure and attributes	4	
	2	Edges and ecotones; Keystone species and control of community structure	4	
	3	Species interactions: Types of interactions	4	
	4	Population Ecology	4	
October	1	Habitat and niche	4	
	2	Ecological succession	4	
	3	Ecosystem: Structure and functions, energy dynamics, Biogeochemical cycles.	4	
	4	Biodiversity, its uses, Hotspots; Threats to biodiversity	4	
November	1	Biodiversity and its conservation.	4	
	2	Environmental pollution: kinds; sources; quality parameters	4	
	3	Climate change and conservation, Major approach to management with special reference to Indian Biosphere reserves.	4	

  
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# 2023-24 Even Semester:

RADHEY HARI GOVERNMENT PG COLLEGE KASHIPUR (US NAGAR) AISHE CODE: C-21911

## TEACHING PLAN-DEPARTMENT OF BOTANY

CLASS: B. Sc.

SEMESTER: 2nd

SESSION: 2023-24

NAME OF PAPER: (BOT201T) Paper 1: Pteridophytes, Gymnosperms and Angiosperms

MONTH	Week Ordinal	TOPICS Alloted: Angiosperms	NO OF LECTURES	REMARKS
Jan	1	Introduction, Taxonomic procedure.	1	
	2	Classification: Types of classification-artificial, natural and phylogenetic	1	
	3	Bentham and Hooker (upto series) Classification	1	
	4	Hutchinson classification	1	
Feb	1	Angiosperm Phylogeny Group (APG IV) classification	1	
	2	Nomenclature (ICN); ranks and names; binominal system, typification, author citation, valid publication, rejection of names, principle of priority and its limitations	1	
	3	Herbarium, important herbaria and botanical gardens of the world and India; Important flora.	1	
	4	Ranunculaceae	1	
March	1	Malvaceae, Rutaceae	1	
	2	Fabaceae	1	
	3	Apiaceae	1	
	4	Asteraceae	1	
April	1	Solanaceae, Lamiaceae	1	
	2	Euphorbiaceae	1	
	3	Orchidaceae, Poaceae	1	

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**TEACHING PLAN-DEPARTMENT OF BOTANY**

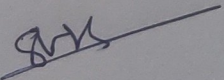
CLASS: B. Sc.

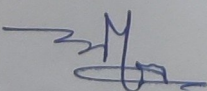
Year: 3rd Year

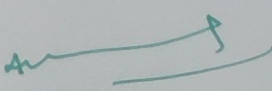
SESSION: 2023-24

NAME OF PAPER: **Paper I:** Plant Physiology, Morphogenesis and Biochemistry**Paper II:** Ecology, Bio-Statistics and Economic Botany

MONTH	Week Ordinal	Topic allotted: <b>Plant Physiology, Economic Botany</b>	Number of Lecture	REMARKS
Aug	1	Diffusion and osmosis	2	
	2	Water potential and its components.	2	
	3	Transpiration and its significance. Factors affecting transpiration	2	
	4	Mechanism of stomatal opening and closing.	2	
Sept	1	Mineral nutrition: Essential elements, macro and micro nutrients.	2	
	2	Criteria of essentiality of elements	2	
	3	Role of essential elements	2	
	4	Minerals deficiency symptoms.	2	
Oct	1	Transport of ions across cell membrane	2	
	2	Active and passive transport, carriers, channels and pumps	2	
	3	Translocation in phloem: composition of phloem sap, girdling experiment	2	
	4	Pressure flow model, phloem loading and unloading.	2	
Nov	1	Respiration: anaerobic respiration.	2	
	2	Respiration: Redox potential, aerobic	2	
	3	Oxidative phosphorylation	2	
	4	Electron transport system	2	
Dec	1	Pentose phosphate pathway	2	
	2	Fermentation	2	
	3	R.Q.	2	
	4	Factors affecting respiration.	2	
Jan	2	Photosynthesis: photosynthetic pigments	2	
	3	Mechanism of photosynthesis	2	
	4	Path of carbon in C <sub>3</sub> plants (C <sub>3</sub> cycle).	2	
Feb	1	C <sub>4</sub> plants (C <sub>4</sub> cycle), CAM pathway	2	
	2	Photorespiration,	2	
	3	Factors affecting rate of photosynthesis.	2	
	4	A brief knowledge of economically important plants and their utilization: Cereals and millets- Wheat, Rice and Maize, Ragi, Pearl millet.	2	
Mar	1	Sugar yielding plants- Sugarcane and Sugar beet.	2	
	2	Fruits- Mango, Apple, Banana, Citrus and Litchi.	2	
	3	Fibers-Cotton, Jute, Hemp, Coir, Agave and Semal.	2	

  
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**TEACHING PLAN-DEPARTMENT OF BOTANY**

CLASS: M. Sc.

SEMESTER: 2nd

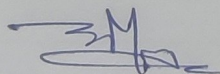
SESSION: 2023-24

NAME OF PAPER: **BOT/IV/EC/16 (iii): Taxonomy of Angiosperms**

MONTH	Week Ordinal	Topic allotted: Diversity and Taxonomy of Angiosperms	NO OF LECTURES	REMARKS
Jan	2	History of different systems of classification (introduction only).	4	
	3	Systems of classification- Benthom and Hooker	4	
	4	Systems of classification- Hutchinson & A. Takhtajan	4	
Feb	1	Systems of classification- A. Cronquist & Robert Thorne	4	
	2	Taxonomic evidences- wood anatomy, embryology & palynology	4	
	3	Taxonomic evidences- cytotaxonomy, chemotaxonomy	4	
	4	Taxonomic evidences- biosystematics and numerical taxonomy.	4	
March	1	Cladistics in taxonomy, relevance of taxonomy to conservation.	4	
	2	Magnoliaceae, Myrtaceae	4	
	3	Cannabaceae, Primulaceae,	4	
	4	Cucurbitaceae	4	
April	1	Scrophulariaceae, Verbinaceae,	4	
	2	Lauranthaceae & Fagaceae	4	
	3	Orchidaceae, Poaceae.	4	
	4	Wild and cultivated fruits of Kumaun	4	



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## TEACHING PLAN-DEPARTMENT OF BOTANY

CLASS: M. Sc.

SEMESTER: 2nd

SESSION: 2023-24

NAME OF PAPER: BOT/II/CC/07: Paper VI: Diversity and Taxonomy of Angiosperms

MONTH	Week Ordinal	Topic allotted: Diversity and Taxonomy of Angiosperms	NO OF LECTURES	REMARKS
	2	Classification: Bentham & Hooker	4	
	3	Classification: Hutchinson	4	
	4	Classification: A. Takhtajan	4	
Feb	1	ICBN- Ranks, Typification, Effective & Valid Publication	4	
	2	Principle of priority and its limitations, author citation, rejection of names	4	
	3	The species concept: Taxonomic Hierarchy, Principles used in assessing relationships	4	
	4	Population and the environment, ecads, ecotypes, evolution and differentiation of species	4	
March	1	Plant exploration in India with special reference to Uttarakhand.	4	
	2	Origin and evolution of angiosperms, Fossils, Type of inflorescence and their origin.	4	
	3	Type of inflorescence and their origin.	4	
	4	Taxonomic tools, histological, cytological, phytochemical, serological, biochemical, and molecular techniques	4	
April	1	Concepts of phytogeography, plant migration, invasions and introduction	4	
	2	Ranunculaceae, Rutaceae, Fabaceae, Rosaceae	4	
	3	Asteraceae, Lamiaceae, Asclepediaceae, Euphorbiaceae, Fagaceae		
	4	Liliaceae, Orchidaceae, Cyperaceae, Poaceae	4	

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# 2023-24 Odd Semester:

RADHEY HARI GOVERNMENT PG COLLEGE KASHIPUR (US NAGAR) AISHE CODE: C-21911

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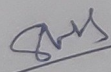
CLASS: B. Sc.

SEMESTER: 1st

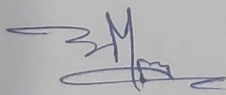
SESSION: 2023-24

NAME OF PAPER: (BOT101T) Microbes, Algae, Fungi and Bryophytes

MONTH	Week Ordinal	TOPICS Allotted: Algae	NO OF LECTURES	REMARKS
AUGUST	1	General characteristics of Algae	1	
	2	Occurrence of Algae	1	
	3	Range of thallus organization	1	
	4	Reproduction- Vegetative, Asexual.	1	
SEPTEMBER	1	Reproduction- Sexual.	1	
	2	Criteria for classification	1	
	3	Classification of algae	1	
	4	<i>Nostoc</i>	1	
OCTOBER	1	<i>Chlamydomonas</i>	1	
	2	<i>Oedogonium</i>	1	
	3	<i>Vaucheria</i>	1	
	4	<i>Sargassum</i>	1	
NOVEMBER	1	<i>Polysiphonia</i>	1	
	2	Life Cycle in Algae	1	
	3	Economic importance of algae	1	



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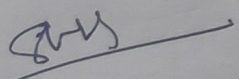
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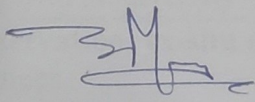
SEMESTER: 1st


SESSION: 2023-24

NAME OF PAPER: (BOT/I/CC/02) Phycology

MONTH	Week Ordinal	Topic allotted: Phycology	NO OF LECTURES	REMARKS
Aug	1	History phycology in India.	4	
	2	Classification of Algae: Criteria of classification, Important systems of Classification.	4	
	3	Position of the Algae in the plant kingdom	4	
	4	Classes and Divisions of Algae, Characteristics of Divisions and classes of Algae	4	
Sept	1	Importance of Algae: Useful and harmful aspects of algae	4	
	2	The Pigments of Algae	4	
	3	Different algal pigments, properties in different algal classes.	4	
	4	Ecology of Algae: Diversified habitats of Algae	4	
Oct	1	Cyanophyta	4	
	2	Chlorophyta	4	
	3	Charophyta	4	
	4	Xantophyta: Heterosiphonales (Botrydium, Vaucheria)	4	
Nov	1	Bacillariophyta	4	
	2	Phaeophyta	4	
	3	Rhodophyta	4	

  
 Dr. Sneha Lata

  
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## TEACHING PLAN-DEPARTMENT OF BOTANY

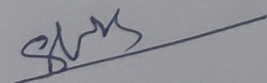
CLASS: M. Sc.

SEMESTER: 3rd

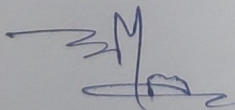
SESSION: 2023-24

NAME OF PAPER: BOT/III/CC/11: Plant Resource Utilization and Conservation

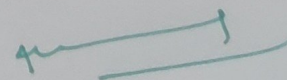
MONTH	Week Ordinal	Topic: Plant Resource Utilization and Conservation	NO OF LECTURES	REMARKS
Aug	1	Sustainable development: Basic concepts	4	
	2	World centres of primary diversity of domesticated plants	4	
	3	An idea of (i) Food, forage and fodder crops. (ii) Fibre crops.	4	
	4	An idea of (iii) Medicinal and Aromatic Plants and (iv) Vegetable oil- yielding crops and their uses.	4	
Sept	1	<b>Important fire-wood and timber-yielding and non-timber forest products (NTFPs)</b> Such as bamboos, rattans	4	
	2	NTFPs Raw materials for paper-making, gums, tannins, dyes, resins and fruits	4	
	3	<b>Green revolution: Benefits</b>	4	
	4	<b>Green revolution: adverse consequences</b>	4	
Oct	1	<b>Plants used as avenue trees:</b> for shade, pollution control and aesthetics	4	
	2	Principles of conservation: extinctions: environmental status of plants based on International Union for Conservation of Nature (IUCN)	4	
	3	<b>Strategies for conservation- in-situ conservation:</b> International efforts and Indian initiatives	4	
	4	Protected areas in India-sanctuaries, National Parks, biosphere reserves, wetlands, mangroves and coral reefs for conservation on wild biodiversity	4	
Nov	1	<b>Strategies for conservation- ex-situ conservation:</b> Principles and practices	4	
	2	Botanical gardens, field gene banks, seed banks, in vitro repositories, cryobanks	4	
	3	General account of the activities of botanical Survey of India (BSI), National Bureau of Plant Genetic resources (NBPGR), Indian Council of Agriculture Research (ICAR), Council of Scientific and Industrial Research (CSIR) and Department of Biotechnology (DBT) for conservation, non-formal conservation efforts.	4	



Dr Sneha Lata



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MONTH	WEEK	TOPICS	NO OF LECTURES	REMARKS
AUGUST	1	Admission		
	2	Admission		
	3	Admission		
	4	Admission		
SEPTEMBER	1	Introduction	2	
	2	Carbohydrates	2	
	3	Monosaccharides & Polysaccharides	3	
	4	Lipids	3	
OCTOBER	1	Proteins	4	
	2	Proteins Sequencing	3	
	3	Photosynthesis	6	
	4	Respiration	5	
NOVEMBER	1	Nitrogen Fixation	5	
	2	Plant Growth Regulators	4	
	3	Photoperiodism & Vernalization	3	
	4	Stress Physiology	2	
DECEMBER	1	Translocation of water & solute	2	
	2	Enzymology	4	
	3	Signal Transduction & Photobiology	3	
	4	Assignments	2	

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RADHEY HARI GOVERNMENT PG COLLEGE KASHIPUR (US NAGAR) AISHE CODE: C-21911

TEACHING PLAN-DEPARTMENT OF BOTANY

CLASS : M.Sc. SEMESTER: Fourth Semester

SESSION:2023-24

NAME OF PAPER : Plant Pathology

MONTH	WEEK	TOPICS	NO OF LECTURES	REMARKS
January	1	Winter Vacation		
	2	Winter Vacation		
	3	Introduction	1	
	4	Types of Pathogen	1	
February	1	Symptoms of diseases	2	
	2	Inoculum	4	
	3	Pathogenesis	2	
	4	Plant Microbe Interaction	4	
March	1	Dissemination of Pathogen	2	
	2	Enzymes Involved in disease	2	
	3	Role of toxins	2	
	4	Physiology of diseased host	2	
April	1	Physiology of diseased host	4	
	2	Disease control	2	
	3	Chemical method	2	
	4	Biological control	2	
May	1	Biological control	2	
	2	Dissertation	4	
	3	Dissertation	4	
	4	Assignments	2	

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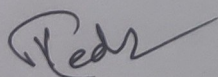
CLASS : B.Sc.

YEAR: IIIrd Year

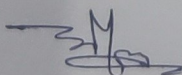
SESSION:2023-24

NAME OF THE PAPER: 1. Biochemistry &amp; 2. Bio-statistics

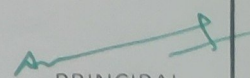
MONTH	WEEK	TOPICS	NO OF LECTURES	REMARKS
AUGUST	1	Admission		
	2	Admission		
	3	Admission		
	4	Admission		
SEPTEMBER	1	Basic Concepts of Biochemistry	3	
	2	Chemical Bonds	3	
	3	Concept of pH	2	
	4	Acid, Bases & Buffers	2	
OCTOBER	1	Carbohydrates	4	
	2	Fats & Lipids	2	
	3	Saturated & Unsaturated Fatty acids	2	
	4	Beta Oxidation	3	
NOVEMBER	1	Proteins	3	
	2	Protein Conformation	3	
	3	Proteins Synthesis	3	
	4	Protein Synthesis	3	
DECEMBER	1	Enzymes	3	
	2	Mechanism of action	3	
	3	Factors affecting enzymes	2	
	4	Holoenzymes, Apoenzymes & Co-factors	3	
JANUARY	1	Bio-statistics - Introduction	1	
	2	Sampling	1	
	3	Presentation of Data	2	
	4	Presentation of Data	2	
FEBRUARY	1	Mean	1	
	2	Median	1	
	3	Mode	1	
	4	Dispersion - range	1	
MARCH	1	Standard Deviation	2	
	2	Standard Error	2	
	3	Correlation	1	
	4	Correlation coefficient	2	
APRIL	1	Chi-square Test	2	
	2	Chi-square Test	2	
	3	Revision	4	
	4	Internal Assesment	2	



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RADHEY HARI GOVERNMENT PG COLLEGE KASHIPUR (US NAGAR) AISHE CODE: C-21911

TEACHING PLAN-DEPARTMENT OF BOTANY

CLASS : M.Sc. SEMESTER: Third Semester

SESSION:2023-24

NAME OF PAPER : Plant Physiology & Biochemistry

MONTH	WEEK	TOPICS	NO OF LECTURES	REMARKS
AUGUST	1	Admission		
	2	Admission		
	3	Admission		
	4	Admission		
SEPTEMBER	1	Introduction	2	
	2	Carbohydrates	2	
	3	Monosaccharides & Polysaccharides	3	
	4	Lipids	3	
OCTOBER	1	Proteins	4	
	2	Proteins Sequencing	3	
	3	Photosynthesis	6	
	4	Respiration	5	
NOVEMBER	1	Nitrogen Fixation	5	
	2	Plant Growth Regulators	4	
	3	Photoperiodism & Vernalization	3	
	4	Stress Physiology	2	
DECEMBER	1	Translocation of water & solute	2	
	2	Enzymology	4	
	3	Signal Transduction & Photobiology	3	
	4	Assignments	2	

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MONTH	WEEK	TOPICS	NO OF LECTURES	REMARKS
January	1	Winter Vacation		
	2	Winter Vacation		
	3	Introduction	1	
	4	Types of Pathogen	1	
February	1	Symptoms of diseases	2	
	2	Inoculum	4	
	3	Pathogenesis	2	
	4	Plant Microbe Interaction	4	
March	1	Dissemination of Pathogen	2	
	2	Enzymes Involved in disease	2	
	3	Role of toxins	2	
	4	Physiology of diseased host	2	
April	1	Physiology of diseased host	4	
	2	Disease control	2	
	3	Chemical method	2	
	4	Biological control	2	
May	1	Biological control	2	
	2	Dissertation	4	
	3	Dissertation	4	
	4	Assignments	2	

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RADHEY HARI GOVERNMENT PG COLLEGE KASHIPUR (US NAGAR) AISHE CODE: C-21911

TEACHING PLAN-DEPARTMENT OF BOTANY

CLASS : M.Sc. SEMESTER: First Semester

SESSION:2023-24

NAME OF PAPER - Microbiology: Bacteria, Virus and Lichens

MONTH	WEEK	TOPICS	NO OF LECTURES	REMARKS
AUGUST	1	Admission		
	2	General account of Microorganisms	4	
	3	Classification of Microbes	2	
	4	Bacteria & Actinomycetes	3	
SEPTEMBER	1	Microbial Growth	2	
	2	Structure of Bacteria	2	
	3	Capsule Cell Wall	3	
	4	Cell Appendages	3	
OCTOBER	1	Plasma Membrane	3	
	2	Cytoplasmic Inclusions	6	
	3	Microbial Genetics	6	
	4	Virus	2	
NOVEMBER	1	Classification of Viruses	2	
	2	Mycophages & Prions	1	
	3	Bacteriophage	2	
	4	TMV	1	
DECEMBER	1	Lichens	3	
	2	Classification & Reproduction	3	
	3	Economic Importance	2	
	4	Revision	4	

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RADHEY HARI GOVERNMENT PG COLLEGE KASHIPUR (US NAGAR) AISHE CODE: C-21911

TEACHING PLAN-DEPARTMENT OF BOTANY

CLASS : M.Sc. SEMESTER: Second Semester

SESSION:2023-24

NAME OF PAPER - Cytogenetics and Plant Breeding

MONTH	WEEK	TOPICS	NO OF LECTURES	REMARKS
January	1	Winter Vacation		
	2	Winter Vacation		
	3	Introduction	2	
	4	Mendelian Principal	4	
February	1	Linkage & Crossing Over	4	
	2	Sex Linked Inheritance	4	
	3	Gene Mapping	4	
	4	Population Genetics	4	
March	1	Structural alteration in Chromosome	2	
	2	Numerical alteration in Chromosome	2	
	3	Mutation	4	
	4	Cell cycle & apoptosis	4	
April	1	Chromosome Structure & Packing	2	
	2	Nuclear DNA content	2	
	3	C value & Cot curve	2	
	4	Genetic fine structure	2	
May	1	RNA splicing	2	
	2	Regulation of Gene Expression	4	
	3	Assignment	2	
	4	Revision	2	

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Radhey Hari Government PG College Kashipur (US Nagar)

AISHE CODE:C-21911

Teaching Plan: **Department of Botany**

Class: B. Sc.

Semester: First

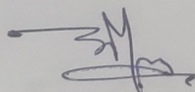
Session: 2023-2024

Name of Paper: **Fungi**

Months	Week	Topics	No. Of lecture	Remarks
August	1	Orientation- syllabus discussion	04	
	2	Introduction-general characteristics		
	3	Ecology and significance		
	4	Range of somatic thallus		
September	1	Organization, cell wall composition	04	
	2	Nutrition, reproduction		
	3	Classification (G.C. Ainsworth)		
	4	Life cycle of <i>Stemonitis</i> (Myxomycota)		
October	1	<i>Rhizopus</i> (Zygomycota)	04	
	2	<i>Penicillium</i> (Ascomycota)		
	3	<i>Puccinia</i>		
	4	<i>Agaricus</i> (Basidiomycota)		
November	1	<i>Alternaria</i> (Deutromycota)	04	
	2	Symbiotic associations: Lichens- General account		
	3	Reproduction and significance		
	4	Mycorrhiza: ectomycorrhiza, endomycorrhiza		
December	1	Significance	04	
	2	Assignment		
	3	Assignment		
	4	Assignment		



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Teaching Plan: **Department of Botany**

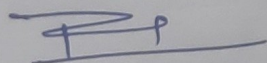
Class: B. Sc.

Semester: Second

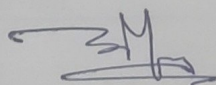
Session: 2023-2024

Name of Paper: **Pteridophytes**

Months	Week	Topics	No. Of lecture	Remarks
January	1	General characteristics	04	
	2	Classification (up to family)		
	3	The Pteridophyte Phylogeny Group (PPG) classification		
	4	Early land plants ( <i>Rhynia</i> )		
February	1	<i>Selaginella</i> morphology	04	
	2	Anatomy		
	3	Reproduction		
	4	<i>Equisetum</i> morphology		
March	1	Anatomy	04	
	2	Reproduction		
	3	<i>Pteris</i> morphology		
	4	Anatomy		
April	1	Reproduction	04	
	2	Heterospory and seed habit		
	3	Stelar evolution		
	4	Telome theory		
May	1	Ecological and economic importance of Pteridophytes	04	
	2	Assignment		
	3	Assignment		
	4	Assignment		



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Teaching Plan: Department of Botany

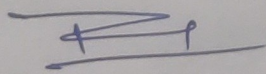
Class: M. Sc.

Semester: First

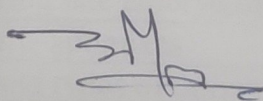
Session: 2023- 2024

Name of Paper: Fungi

Months	Week	Topics	No. Of lecture	Remarks
August	1	General characteristics and Classification of Fungi	04	
	2	Reproduction in Fungi (vegetative, asexual and sexual)	04	
	3	Heterothallism and Heterokaryosis, Parasexual cycle	04	
	4	Recent trends in classification of Fungi	04	
September	1	Phylogeny of Fungi and Importance of Fungi	04	
	2	General account of	04	
	3	<b>Myxomycotina:</b> <i>Stemonitis Physarum</i>	04	
	4	<b>Mastigomycotina:</b> <i>Allomyces, Monoblepharis.</i>	04	
October	1	<b>Oomycotina:</b> <i>Saprolegnia, Pythium,</i>	04	
	2	<i>Phytophthor, Sclerospora.</i>	04	
	3	<b>Zygomycotina:</b> <i>Mucor, Pilobolus, Entomophthora.</i>	04	
	4	<b>Ascomycotina:</b> <i>Aspergillus, Saccharomyces</i>	04	
November	1	<i>Penicillium, Peziza, Cordiceps,</i>	04	
	2	<i>Phyllactinia, Claviceps</i>	04	
	3	<b>Basidiomycotina:</b> <i>Puccinia, Ustilago</i>	04	
	4	<i>Uromyces, Geastrum, Fomes</i>	04	
December	1	<b>Deuteromycotina:</b> <i>Fusarium, Cercospora</i>	04	
	2	<i>Colletotrichum,</i>	04	
	3	<i>Trichoderma</i>	04	
	4	<i>Helminthosporium.</i>	04	



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Teaching Plan: **Department of Botany**

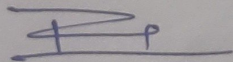
Class: M. Sc.

Semester: Second

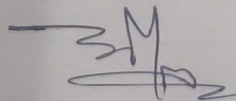
Session: 2023- 2024

Name of Paper: **Plant Development and Reproductive Biology**

Months	Week	Topics	No. Of lecture	Remarks
January	1	Morphology of flower, Stamen and Carpel	04	
	2	Floral Characteristics, structure of the pistil	04	
	3	Pollen stigma interactions	04	
	4	Plant adaptation – physiological and their morphological nature	04	
February	1	<b>Shoot development</b>	04	
	2	Tissue differentiation, especially xylem and phloem	04	
	3	Leaf growth and differentiation, structural development and classification of stomata and trichomes.	04	
	4	<b>Root Development</b>	04	
March	1	Structure of anthers, microsporogenesis, role of tapetum, pollen development	04	
	2	Pollen germination, pollen tube growth and guidance, pollen allergy	04	
	3	Ovule development, megasporogenesis	04	
	4	Development and organization of the embryo sac, structure of the embryo sac cells.	04	
April	1	Pollination mechanism and vectors, sporophyte and gemetophytic self-incompatibility	04	
	2	Double fertilization.	04	
	3	Endosperm development during early maturation and desiccation stages: embryogenesis	04	
	4	Lineages during late embryo development	04	
May	1	Polyembryony, apomixes	04	
	2	Importance and types of dormancy:	04	
	3	Seed dormancy, bud dormancy	04	
	4	Assignment	04	



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Teaching Plan: **Department of Botany**


Class: M. Sc.

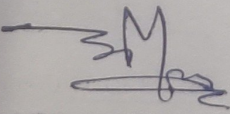
Semester: Third

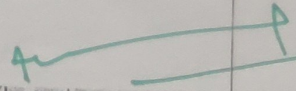
Session: 2023- 2024

Name of Paper: **Biotechnology**

Months	Week	Topics	No. Of lecture	Remarks
August	1	Biotechnology: Principle and scope, bio-safety guidelines	04	
	2	Concept of cellular totipotency, principle of root and shoot generation in vitro	04	
	3	Clonal propagation, applications of cell and tissue culture	04	
	4	Callus culture, organ culture	04	
September	1	Cell suspension culture, cryopreservation	04	
	2	Protoplast culture, organogenesis, somatic embryogenesis, artificial seed	04	
	3	Somatic hybridization, hybrids and cybrids, and somaclonal variation	04	
	4	Recombinant DNA technology: Tools of genetic engineering, enzymes,	04	
October	1	Cloning vectors, plasmids, cosmids	04	
	2	Lamda phage, shuttle vectors, BACs, and YACs	04	
	3	Cloning strategies, Screening and selection of transformants	04	
	4	Gene libraries (a general account): Genomic DNA libraries, cDNA libraries	04	
November	1	Hybridization- colony hybridization, Southern hybridization,	04	
	2	Northern hybridization, Western hybridization	04	
	3	DNA sequencing techniques: Concept of nucleic acid sequencing	04	
	4	Maxam and Gilbert sequencing, Sanger sequencing	04	
December	1	Genetic Engineering of plants: Aims, tools	04	
	2	Strategies for development of transgenic plant with suitable example	04	
	3	Assignment	04	
	4	Assignment	04	


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Teaching Plan: **Department of Botany**

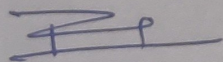
Class: M. Sc.

Semester: Forth

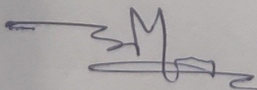
Session: 2023- 2024

Name of Paper: **Plant Pathology**

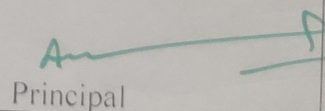
Months	Week	Topics	No. Of lecture	Remarks
January	1	A brief history of plant pathology in India and losses caused by pathogens and pests	04	
	2	types of pathogens, symptoms of different diseases	04	
	3	Inoculum	04	
	4	Plant microbes interaction	04	
February	1	Dissemination of pathogens	04	
	2	Genetics and host parasite interaction: Concept of compatibility and specificity, gene for gene relationship	04	
	3	genetics of resistance, source of resistance, inheritance of resistance in the host	04	
	4	Enzymes and toxins	04	
March	1	Physiology of diseased hosts: Change in physiology processes, e.g., respiration	04	
	2	photosynthesis and disturbance in other metabolic pathways	04	
	3	Disease resistance: (i) Protection (structural, chemical, absence of nutrients and common antigens	04	
	4	(ii) Defence (histology defence, chemical-polyphenols, prohibitins, inhabitins, phytoalexins, lectins),	04	
April	1	(iii) Genetic resistance: resistant genes, biotechnological approaches for transfer of R-genes into susceptible plant.	04	
	2	Seed pathology	04	
	3	Disease control	04	
	4	Brief account, structure, importance, disease cycle and control	04	
May	1	(i) Damping off, (ii) Wilt, (iii) Root rot, stem rot and fruit rot (iv) Mildews (powdery and downy)	04	
	2	(v) Rusts, smuts, (vi) Leaf spots and leaf blights	04	
	3	General characteristics, importance, disease cycle and control of the following: (i) Bacterial disease	04	
	4	(ii) Viral disease, (iii) Mycoplasma disease	04	



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