

Vidyasagar Metropolitan College

39, Sankar Ghosh Lane & 8A, Shibnarayan Das Lane, Kolkata-700006

DEPARTMENT OF BOTANY

LESSON PLAN

Subject: B. Sc. (G)

Name of the Paper: Plant Diversity I (Phycology, Mycology, Phytopathology, Bryophytes and Anatomy)

Paper Code: (BOT-G-CC-1-1-TH)

Class: Semester I

Academic Year: 2022- 23

Total marks 50; Credits 4, Class 60 hours

**Teachers: Dr. Priyanka Khanduri (PK)
Mrs. Mahasweta Das Banerjee (MD)**

S	Main Topic	Sub Topics	No. of Periods	Teacher
Unit I	Introduction	Introduction to different plant groups	2	PK
Unit II	Phycology	2.1. Diagnostic characters and examples of Cyanophyceae, Rhodophyceae, Chlorophyceae, Charophyceae and Phaeophyceae	4	MD
		2.2 Classification: Criteria and system of Fritsch	2	
		2.3. Life histories of <i>Chlamydomonas</i> , <i>Chara</i> and <i>Ectocarpus</i> ,	6	
		2.4. Role of algae in the environment, agriculture, biotechnology and industry.	2	
Unit III	Mycology	3.1 Diagnostic characters and examples of Oomycotina, Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina (Ainsworth, 1973)	4	PK
		3.2 Life histories of <i>Rhizopus</i> and <i>Ascobolus</i> ,	4	
		3.3. Economic importance of fungi,	1	
		3.4 Fungal symbioses: <i>Mycorrhiza</i> , Lichen and their importance.	3	
Unit IV	Phytopathology	4.1 Symptoms - necrotic, hypoplastic and hyperplastic,	2	PK
		4.2 Koch's postulates,	1	
		4.3 Biotrophs and Necrotrophs,	2	
		4.4 Disease triangle,	1	
		4.5 Pathotoxins and phytoalexins (brief concept)	2	

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		4.6 Symptoms, causal organism, disease cycle and control measures of plant diseases (Late blight of potato, Brown spot of Rice, Stem rot of jute).	4	
Unit V	Bryophytes	5.1 Unifying features of archaegoniates and transition to land habit	2	PK
		5.2 Amphibian nature of bryophytes	1	
		5.3 Diagnostic characters and examples of Hepaticopsida, Anthocerotopsida and Bryopsida (Proskauer 1957),	2	
		5.4 Life histories of <i>Marchantia</i> and <i>Funaria</i> ,	3	
		5.5 Ecological and economic importance.	2	
Unit VI	Anatomy	6.1 Stomata - Types (Metcalf & Chalk)	2	PK
		6.2 Anatomy of root, stem and leaf of monocots and dicots	4	
		6.3 Stelar types and evolution	2	
		6.4 Secondary growth – normal in dicot stem and anomaly in stem of <i>Tecoma</i> & <i>Dracaena</i>	4	
Total Class:			60	

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DEPARTMENT OF BOTANY

LESSON PLAN

Subject: B. Sc. (G)

Name of the Paper: Plant Diversity II (Pteridophytes, Gymnosperms, Palaeobotany, Morphology and Taxonomy)

Paper Code: (BOT-G-CC-2-2-TH)

Class: Semester II

Academic Year: 2022- 23

Total marks 50; Credits 4, Class 60 hours

**Teachers: Dr. Priyanka Khanduri (PK)
Mrs. Mahasweta Das Banerjee (MD)**

S	Main Topic	Sub Topics	No. of Periods	Teacher
Unit I	Pteridophytes	1.1 Diagnostic characters and examples of Psilophyta, Lycophyta, Sphenophyta & Filicophyta (Gifford & Foster 1989).	6	MD
		1.2 Life histories of <i>Selaginella</i> and <i>Pteris</i> ,	4	
		1.3 Economic importance.	2	
Unit II	Gymnosperms	2.1 Progymnosperms (brief idea),	2	MD
		2.2 Diagnostic characters and examples of Cycadophyta, Coniferophyta and Gnetophyta (Gifford & Foster 1989)	4	
		2.3 Life histories of <i>Cycas</i> and <i>Pinus</i> ,	4	
		2.4 <i>Williamsonia</i> (reconstructed),	1	
		2.5 Economic importance of Gymnosperms.	1	
Unit III	Paleobotany & Palynology	3.1 Fossil, fossilization process and factors of fossilization,	4	MD
		3.2 Importance of fossil study.	1	
		3.3 Geological time scale,	2	
		3.4 Palynology - Definition, spore & pollen (brief idea), Applications.	3	
Unit IV	Angiosperm Morphology	4.1 Inflorescence types with examples,	4	PK
		4.2 Flower,	4	

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		4.3 Fruits and seeds- type and examples	4	
Unit V	Taxonomy of Angiosperms	5.1 Artificial, Natural and Phylogenetic systems of classificaiton with one example each	5	PK
		5.2 Diagnostic features of following families- Malvaceae, Leguminosae (Fabaceae), Cucurbitaceae, Rubiaceae, Compositae (Asteraceae), Solanaceae, Acanthaceae, Labiatae (Lamiaceae), Orchidaceae, Gramineae (Poaceae).	9	
Total Class:			60	

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DEPARTMENT OF BOTANY**LESSON PLAN****Subject: B. Sc. (G)****Name of the Paper: Cell Biology, Genetics and Microbiology****Paper Code: (BOT-G-CC-3-3-TH)****Class: Semester III****Academic Year: 2022- 23****Total marks 50; Credits 4, Class 60 hours****Teachers: Dr. Priyanka Khanduri (PK)****Mrs. Mahasweta Das Banerjee (MD)**

Unit No.	Main Topic	Sub Topics	No. of Periods	Teacher
Unit I	Cell Biology and Genetics	1.1 Ultrastructure of nuclear envelope, nucleolus and their functions,	2	PK
		1.2 Molecular organisation of metaphase chromosome (Nucleosome concept)	4	
Unit II		Chromosomal aberrations- 2.1 deletion, duplication, inversion & translocation,	3	PK
		2.2 Aneuploidy & Polyploidy-types, importance and role in evolution.	3	
Unit III		Central Dogma, 3.1 Transcription and Translation	10	PK
Unit IV		Genetic Code- properties	4	PK
Unit V		Linkage group and Genetic map (three-point test cross)	6	PK
Unit VI		Mutation – 6.1 Point mutation (tautomerisation; transition, transversion and frame shift), 6.2 Mutagen-physical and chemical.	4+4	PK
Unit VII		Brief concept of Split gene, Transposons	4	Pk
Unit VIII	Microbes	2.1 Viruses- Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); Economic importance;	8	MD

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		2.2 Bacteria- discovery, general characteristics and cell structure; reproduction- vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.	8	MD
Total Class:			60	



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DEPARTMENT OF BOTANY

LESSON PLAN

Subject: B. Sc. (G)

Name of the Paper: Plant Physiology and Metabolism

Paper Code: (BOT-G-CC-4-4-TH)

Class: Semester IV

Academic Year: 2022- 23

Total marks 50; Credits 4, Class 60 hours

Teachers: Dr. Priyanka Khanduri (PK)
Mrs. Mahasweta Das Banerjee (MD)

Unit No.	Main Topic	Sub Topics	No. of Periods	Teacher
Unit I	Proteins	1.1 Primary, secondary and tertiary structure,	3	PK
		1.2 Nucleic acid- DNA structure, RNA types,	2	
		1.3 Enzyme- Classifications with examples (IUBMB), Mechanism of action	3	
Unit II	Transport in plants	2.1 Ascent of sap and Xylem cavitation	2	MD
		2.2 Phloem transport and source-sink relation.	2	
Unit III	Transpiration	3.1 Mechanism of stomatal movement, significance.	4	MD
Unit IV	Photosynthesis	4.1 Pigments, Action spectra and Enhancement effect,	2	PK
		4.2 Electron transport system and Photophosphorylation	4	
		4.3 C ₃ and C ₄ photosynthesis, CAM- Reaction and Significance	6	
Unit V	Respiration	5.1 Glycolysis & Krebs cycle— Reactions and Significance,	4	PK
		5.2 ETS and oxidative phosphorylation.	4	
Unit VI	Nitrogen metabolism	6.1 Biological dinitrogen fixation	4	PK
		6.2 Amino acid synthesis (reductive amination and transamination).	2	
Unit VII	Plant Growth regulators	7.1 Physiological roles of Auxin, Gibberellin, Cytokinin, Ethylene, ABA.	10	PK

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Unit VIII	Photoperiodism	(Plant types, Role of phytochrome and GA in flowering) and Vernalization	6	PK
Unit IX	Senescence	Senescence (brief idea)	2	MD
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DEPARTMENT OF BOTANY

LESSON PLAN

Subject: B. Sc. (G)

Name of the Paper: Phytochemistry and Medicinal Botany

Paper Code: BOT-G-DSE-A-5-1-TH

Class: Semester V

Academic Year: 2022- 23

Total marks 50; Credits 4, Class 60 hours

Teachers: Dr. Priyanka Khanduri (PK)
Mrs. Mahasweta Das Banerjee (MD)

Unit No.	Main Topic	Sub Topics	No. of Periods	Teacher
Unit I	Medicinal botany	History, scope and importance of medicinal plants	2	MD
		A brief idea about indigenous medicinal sciences- Ayurveda, Siddha and Unani	8	
		Polyherbal formulations	2	
Unit II	Pharmacognosy	2.1 Scope and its importance	1	PK
		2.2 Primary metabolites	1	
		2.3 Secondary metabolites- alkaloids, terpenoids, phenolics and their functions	8	
Unit III	Organoleptic evaluation	Organoleptic evaluation of crude drugs.	10	PK
Unit IV	Pharmacologically active constituents	Source plants (one example), parts used and uses of: 4.1 Steroids (Diosgenin, Digitoxin), 4.2 Tannin (Catechin), 4.3 Resins (Gingerol, Curcuminoids), 4.4 Alkaloids (Strychnine, Reserpine, Vinblastine), 4.5 Phenols (Capsaicin).	6	PK

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Unit V	Ethnobotany and folk medicine	5.1 Brief idea, 5.2 Applications of ethnobotany, 5.3 Application of natural product to certain diseases- Jaundice, Cardiac and Diabetics. .	20	MD
Total Class:			60	



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DEPARTMENT OF BOTANY

LESSON PLAN

Subject: B. Sc. (G)

Name of the Paper: Plant Breeding and Biometry

Paper Code: BOT-G-SEC-A-3/5-1

Class: Semester V

Academic Year: 2022- 23

Total marks 80; Credits 2, Class 30 hours

Teachers: Dr. Priyanka Khanduri (PK)

Unit No.	Main Topic	Sub Topics	Teacher	No. of Periods
1	Plant breeding	1.1 Introduction and objective, 1.2 Techniques of hybridisation.	PK	2
2	Mass and Pure line selection	2.1 Procedure 2.2 Advantages and limitations.	PK	8
3		Heterosis and hybrid seed production	PK	4
4		Role of mutation, polyploidy, distant hybridization and role of biotechnology in crop improvement.	PK	8
5	Biometry	5.1 Measures of central tendency (Mean, Median and Mode), 5.2 Standard error and standard deviation, 5.3 Test of significance: Chi-square test for goodness of fit.	PK	8

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DEPARTMENT OF BOTANY

LESSON PLAN

Subject: B. Sc. (G)

Name of the Paper: Economic Botany

Paper Code: BOT-G-DSE-B-6-3-TH

Class: Semester VI

Academic Year: 2022- 23

Total marks 50; Credits 4, Class 60 hours

Teachers: Dr. Priyanka Khanduri (PK)
Mrs. Mahasweta Das Banerjee (MD)

Unit No.	Main Topic	Sub Topics	No. of Periods	Teacher
Unit I	Origin of cultivated plants:	1.1 Concepts of centres of origin and their importance with reference to Vavilov's work.	12	MD
Unit II	Rice	2.1 Origin, morphology and uses	12	MD
Unit III	Legumes	3.1 General account with special reference to <i>Vigna</i> .	8	PK
Unit IV	Beverages	4.1 Tea- morphology, processing and uses	12	PK
Unit V	Study of the following economically important plants (Scientific names, families, parts used and importance)	5.1 Cereals- Rice, wheat, 5.2 Pulses- Mong, gram, 5.3 Spices-Ginger, cumin, 5.4 Beverages- Tea, coffee, 5.5 Medicinal plants- Cinchona, neem, Ipecac, Vasaka, 5.6 Oil yielding plants- Mustard, groundnut, coconut,	16	PK

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		5.7 Vegetables- Potato, raddish, bottle groud, cabbage, 5.8 Fibre yielding plants- Cotton, jute, 5.9 Timber yielding plants- Teak, Sal 5.10 Fruits- Mango, apple, 5.11 Sugar yielding plant- Sugarcane.		
Total Class:			60	



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DEPARTMENT OF BOTANY

LESSON PLAN

Subject: B. Sc. (G)

Name of the Paper: Plant Biotechnology

Paper Code: BOT-G- SEC-B -6-3-TH

Class: Semester VI

Academic Year: 2022- 23

Total marks 80; Credits 2, Class 30 hours

Teachers: Dr. Priyanka Khanduri (PK)

Unit No.	Main Topic	Sub Topics	Teacher	No. of Periods
1	Plant tissue culture	1.1 Introduction and basic concepts, 1.2 Cellular potency, 1.3 Callus culture and plant regeneration.	PK	4
2	Micropropagation-	2.1 Somatic embryogenesis and artificial seed.	PK	4
3	Protoplast culture and its application		PK	6
4	Recombinant DNA technology	4.1 Recombinant DNA, 4.2 Restriction enzymes, 4.3 Plasmids as vectors.	PK	8
5	Gene cloning (basic steps)		PK	4
6	Achievements in crop biotechnology	6.1 Pest resistant plant (Bt cotton), 6.2 Transgenic crops with improved quality (flavr tomato and golden rice)	PK	4

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Subject: B. Sc. (G)

Name of the Paper: Phytochemistry and Medicinal Botany

Paper Code: BOT-G-DSE-A-5-1-TH

Class: Semester V

Academic Year: 2023- 24

Total marks 50; Credits 4, Class 60 hours

Teachers: Dr. Priyanka Khanduri (PK)
Mrs. Mahasweta Das Banerjee (MD)

Unit No.	Main Topic	Sub Topics	No. of Periods	Teacher
Unit I	Medicinal botany	History, scope and importance of medicinal plants	2	MD
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Unit II	Pharmacognosy	2.1 Scope and its importance	1	PK
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DEPARTMENT OF BOTANY

LESSON PLAN

Subject: B. Sc. (G)

Name of the Paper: Economic Botany

Paper Code: BOT-G-DSE-B-6-3-TH

Class: Semester VI

Academic Year: 2023- 24

Total marks 50; Credits 4, Class 60 hours

Teachers: Dr. Priyanka Khanduri (PK)
 Mrs. Mahasweta Das Banerjee (MD)

Unit No.	Main Topic	Sub Topics	No. of Periods	Teacher
Unit I	Origin of cultivated plants:	1.1 Concepts of centres of origin and their importance with reference to Vavilov's work.	12	MD
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		coconut, 5.7 Vegetables- Potato, raddish, bottle groud, cabbage, 5.8 Fibre yielding plants- Cotton, jute, 5.9 Timber yielding plants- Teak, Sal 5.10 Fruits- Mango, apple, 5.11 Sugar yielding plant- Sugarcane.		
Total Class:			60	



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