

**DEPARTMENT OF BOTANY
LESSON PLAN
SESSION 2023-24
SEMESTER – IV**

NAME OF TEACHER: BHANUMATI SARKAR

**PAPER ALLOTTED: MOLECULAR BIOLOGY(BOTACOR08T),MOLECULAR
BIOLOGY(BOTACOR08P),PLANT SYSTEMATICS(BOTACOR10P), PLANT
PHYSIOLOGY & METABOLISM(BOTHGEC04T/BOTGCOR04T),ETHNOBOTANY
(BOTSSEC02M)**

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	Molecular BiologyBOTACOR08T	Unit 5: Transcription: Transcription in prokaryotes and eukaryotes. Principles of transcriptional regulation (Operon concept). Prokaryotes: regulation of lactose metabolism and tryptophan synthesis in E.coli.	4
	Molecular BiologyBOTACOR08P	1. Preparation of LB medium 2. DNA isolation from cauliflower head.	12
	Plant Physiology & Metabolism BOTHGEC04T/BOTGCOR04T	Unit:2 Mineral Nutrition: Essential elements, macro and micronutrients; Criteria of essentiality of elements; Role of essential elements	4
	BOTHGEC04P/ BOTGCOR04P	Demonstration experiments: 1.Effect of auxins on rooting. 2. Suction due to transpiration. 3. R.Q. 4. Respiration in roots.	8
	Skill Enhancement Course -2 Ethnobotany Course code: BOTSSEC02M	Unit 2: Methodology of Ethnobotanical studies: a) Field work b) Herbarium c) Ancient Literature d) Archaeological findings e) temples and sacred places	4
April 2024	Molecular Biology BOTACOR08T	Unit 6: Processing and modification of RNA: Split genes-concept of introns and exons, removal of introns, spliceosome machinery, splicing pathways, group I and group II intron splicing, alternative splicing ,eukaryotic mRNA processing (5' cap, 3' polyA tail); Ribozymes; RNA editing and mRNA transport.	4

	Molecular Biology BOTACOR08P	3. DNA estimation by diphenylamine reagent/UV Spectrophotometry. 5. Study of structures of prokaryotic RNA polymerase and eukaryotic RNA polymerase II through photo graphs.	12
	Plant Physiology & Metabolism BOTHGEC04T/BOTGCOR04T	Unit:2 Mineral Nutrition: Transport of ions across cell membrane, active and passive transport, carriers, channels and pumps.	4
	BOTHGEC04P/ BOTGCOR04P	1. Determination of osmotic potential of plant cell sap by plasmolytic method. 2. To study the effect of two environmental factors (light and wind) on transpiration byexcised twig. 3. Calculation of stomatal index and stomatal frequency of a mesophyte and axerophyte	8
	Skill Enhancement Course -2 Ethnobotany Course code: BOTSSEC02M	Project on Methodology of Ethnobotanical studies	2
May 2024	Molecular Biology BOTACOR08T	Unit 7: Translation: Ribosome structure and assembly, mRNA; charging of tRNA, aminoacyl tRNA synthetases; various steps in protein synthesis, proteins involved in initiation, elongation and termination of polypeptides; fidelity of translation; inhibitors of protein synthesis; post-translational modifications of protein	4
	Molecular BiologyBOTACOR08P	7. Study of the following through photographs: assembly of Spliceosome machinery; splicing mechanism in group I & group II introns; ribozyme and alternative splicing	6
	BOTHGEC04P/ BOTGCOR04P	4. Demonstrate the activity of catalase and study the effect of pH and enzymeconcentration. 5. To study the effect of bicarbonate concentration on O2 evolution inphotosynthesis. 6. Comparison of the rate of respiration in any two parts of a plant	8
	Plant Physiology & Metabolism BOTHGEC04T/BOTGCOR04T	Unit:6 Enzyme: Structure and properties; Mechanism of enzyme catalysis and enzyme inhibition	4
1st Week June 2024		Internal Examination & Class for Slow Learners Local excursion & herbarium preparation Peer learning	4
2nd Week June		Student's seminar(with ppt), „Revision class	2

2024			
3 rd Week June 2024		Class test(both theory and practical)	2
Last week of June 2024		Solve model Question paper and previous university Questions.	2
1 st Week July 2024		Revision class	2
2 nd Week July 2024		Mock Test	2
13.07.2024		END SEMESTER EXAMINATION	
Total Classes			98

NAME OF TEACHER: **MADHURIMA ROY**

PAPER ALLOTTED: MOLECULAR BIOLOGY (BOTACOR08T), PLANT SYSTEMATICS
(BOTACOR10T, BOTACOR10P), PLANT PHYSIOLOGY AND METABOLISM
(BOTHGEC04T/ BOTGCOR04T)

Month	Paper	Topic	No. of classes
March 2024 (02.03.2024)	BOTACOR08T	The Structures of DNA and RNA / Genetic Material: organelle DNA - mitochondria and chloroplast DNA. The nucleosome, Chromatin structure- euchromatin, heterochromatin- constitutive and facultative heterochromatin. (Unit 2) Transcription: Eukaryotes: transcription factors, heat shock proteins (Unit-5) Continued...	4
	BOTACOR10T	Taxonomic hierarchy: Species concept (taxonomic, biological, evolutionary). (Unit- 2)	3
	BOTACOR10P	Study of the vegetative and floral characters of the following families (fifteen species among them) description, VS of flower, section of ovary, floral diagram/s, floral formula and systematic position according to Bentham & Hooker's system of classification: Asteraceae (Compositae) - <i>Tridax</i> Scrophulariaceae – <i>Lindenbergia</i> and <i>Mazus</i>	10
	BOTHGEC04T/ BOTGCOR04T	Photosynthesis: Reaction center. Antenna molecules; Electron transport and mechanism of ATP synthesis. (Unit-4)	4

		Continued...	
April 2024	BOTACOR08T	The Structures of DNA and RNA / Genetic Material: types of DNA, types of genetic material, denaturation and renaturation, cot curves; organization of DNA- prokaryotes, viruses, eukaryotes. RNA structure. (Unit 2) Transcription: Steroids hormones (Unit-5) Continued...	4
	BOTACOR10T	Taxonomic hierarchy: Concept of taxa (family, genus, species); categories and taxonomic hierarchy; (Unit-2) Phylogeny of Angiosperms: Terms and concepts (primitive and advanced, homology and analogy) (Unit-6) Continued...	4
	BOTACOR10P	Study of the vegetative and floral characters of the following families (fifteen species among them) description, VS of flower, section of ovary, floral diagram/s, floral formula and systematic position according to Bentham & Hooker's system of classification: <i>Solanaceae - Solanum spp. and Physalis</i>	4
	BOTHGEC04T/ BOTGCOR04T	Photosynthesis: Photosynthetic Pigments (Chl a, b, xanthophylls, carotene); Photosystem I and II, C3, C4 pathways of carbon fixation (Unit-4) Continued...	4
May 2024	BOTACOR08T	Transcription: peptide hormone; Gene Silencing. (Unit-5)	3
	BOTACOR10T	Phylogeny of Angiosperms: Terms and concepts (parallelism and convergence, Monophyly, paraphyly, polyphyly and clades.) (Unit-6)	4
	BOTACOR10P	Study of the vegetative and floral characters of the following families (fifteen species among them) description, VS of flower, section of ovary, floral diagram/s, floral formula and systematic position according to Bentham & Hooker's system of classification: <i>Euphorbiaceae - Croton</i> <i>Rubiaceae – Dentella, Oldenlandia</i>	8
	BOTHGEC04T/ BOTGCOR04T	Photosynthesis: CAM pathways of carbon fixation; Photorespiration. (Unit-4)	3
June (1 st Week) 2024	Internal Examination & Class for Slow Learners		7
June 2024	BOTACOR08T	Class tests	2
	BOTACOR10T	Class tests	2
	BOTACOR10P	Revision classes	2

	BOTHGEC04T/ BOTGCOR04T	Class Test	1
July 2024		END SEMESTER EXAMINATION	-
Total Classes			69

NAME OF TEACHER: DR. MOULI SAHA

PAPER ALLOTTED: PLANT ECOLOGY AND PHYTOGEOGRAPHY (BOTACOR09T, BOTACOR09P), PLANT PHYSIOLOGY AND METABOLISM (BOTHGEC04T/ BOTGCOR04T, BOTHGEC04P/BOTGCOR04P)

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	BOTACOR09T	Introduction: Basic concepts; Levels of organization. Homeostasis. (UNIT-1) Soil: Importance; origin; formation (UNIT-2)	5
	BOTACOR09P	Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter. (UNIT-1)	8
	BOTHGEC04T/ BOTGCOR04T	Plant-water relations: Importance of water, water potential and its components; Transpiration and its significance. (UNIT-1)	4
	BOTHGEC04P/ BOTGCOR04P	Demonstration experiments: 1.Effect of auxins on rooting. 2. Suction due to transpiration. 3. R.Q. 4. Respiration in roots.	8
	BOTACOR09T	Soil: composition; physical; chemical and biological components; soil profile; role of climate in soil development (UNIT-2) Biotic interactions: Trophic organization, basic source of energy; symbiosis, commensalism, parasitism; food chains and webs; ecological pyramids; biomass, standing	5

April 2024		crop. (UNIT-5)	
	BOTACOR09P	<p>Study of anatomical adaptations of hydrophytes and xerophytes – by preparation of temporary slides of Nymphaea petiole, Hydrilla stem, Nerium and Casuarina leaf. (UNIT-6a)</p> <p>Study of biotic interactions of the following: Stem parasite (Cuscuta), Epiphytes (Vanda root), Predation (Insectivorous plants) – from permanent slides and preserved specimens. (UNIT-6b)</p>	8
	BOTHGEC04T/ BOTGCOR04T	Plant-water relations: Factors affecting transpiration; Root pressure and guttation. (UNIT-1)	4
	BOTHGEC04P/ BOTGCOR04P	<p>1. Determination of osmotic potential of plant cell sap by plasmolytic method.</p> <p>2. To study the effect of two environmental factors (light and wind) on transpiration by excised twig.</p> <p>3. Calculation of stomatal index and stomatal frequency of a mesophyte and xerophyte</p>	8
May 2024	BOTACOR09T	Plant communities: Concept of ecological amplitude; habitat and niche; characters-analytical and synthetic; ecotone and edge effect; dynamics - succession: processes, types; climax concepts (UNIT-7)	4
	BOTACOR09P	<p>Determination of minimum size of quadrat for the study of herbaceous vegetation by species area curve method (species to be listed). (UNIT-7)</p> <p>Quantitative analysis of herbaceous vegetation for frequency and comparison with Raunkiaer's frequency distribution law. (UNIT-8)</p> <p>Quantitative analysis of herbaceous vegetation for density and abundance.</p>	8

		(UNIT-9)	
	BOTHGEC04T/ BOTGCOR04T	Nitrogen metabolism: Biological nitrogen fixation; Nitrate and ammonia assimilation. (UNIT-7)	4
	BOTHGEC04P/ BOTGCOR04P	4. Demonstrate the activity of catalase and study the effect of pH and enzyme concentration. 5. To study the effect of bicarbonate concentration on O ₂ evolution in photosynthesis. 6. Comparison of the rate of respiration in any two parts of a plant	8
June (1 st Week) 2024	Internal Examination & Class for Slow Learners		7
June 2024	BOTACOR09T	Ecosystems: Structure and processes; trophic organisation; food chains and food webs; ecological pyramids. (UNIT-8) Class Tests	4
	BOTACOR09P	Field visit to familiarize students with ecology of different sites (UNIT-10). Continuation... Revision Class	4
	BOTHGEC04T/ BOTGCOR04T	Class Test	2
	BOTHGEC04P/ BOTGCOR04P	Revision Class	2
July 2024	END SEMESTER EXAMINATION		-
Total Classes			93

NAME OF TEACHER: NANDITA DEY

PAPER ALLOTTED: PLANT SYSTEMATICS (BOTACOR10T, BOTACOR10P),
PLANT PHYSIOLOGY AND METABOLISM (BOTHGEC04T/BOTGCOR04T)

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	BOTACOR10T	Significance of plant systematic: introduction to systematic, plant identification, classification, nomenclature. evidences from- palynology, cytology, phytochemistry and molecular data. function of herbarium and botanical garden, importance of herbaria and botanical gardens of the world and India, virtual herbarium, e-flora, documentation, flora, monographs, journals, keys, single and multi-access (UNIT-1)	6
	BOTACOR10P	Study of the vegetative and floral characters of the following families (fifteen species among them) description, VS of flower, section of ovary, floral diagram/s, floral formula and systematic position according to Bentham & Hooker's system of classification: Solanaceae - <i>Solanum</i> spp. and <i>Physalis</i> Asteraceae (Compositae) - <i>Tridax</i>	8
	BOTHGEC04T/BOTGCOR04T	Plant growth regulators: discovery and physiological roles of- auxin, cytokinins, gibberellins, ABA, ethylene. (UNIT-8)	5
April 2024	BOTACOR10T	Botanical Nomenclature: principles and rules (ICN), ranks and names, typification, author citation, valid publication, rejection of names, principles of priority and its limitations, names of hybrids. (UNIT-3)	6
	BOTACOR010P	Study of the vegetative and floral characters of the following families (fifteen species among them) description, VS of flower, section of ovary, floral diagram/s, floral formula and systematic position according to Bentham & Hooker's system of classification: Rubiaceae – <i>Oldenlandia</i> Scrophulariaceae – <i>Lindenbergia</i> and <i>Mazus</i>	6
	BOTHGEC04T/BOTGCOR04T	Plant Response to light and temperature: Photoperiodism (SDP, LDP, Day neutral plants), phytochrome (discovery and structure), red and far red light responses on photomorphogenesis, vernalization. (UNIT-9)	5
May 2024	BOTACOR10T	Biometrics, Numerical taxonomy and cladistics: characters, variations, OTS', Character	5

		weighting and coding, cluster analysis, phenograms, cladograms (definition, differences) (UNIT-5)	
	BOTACOR10P	Study of the vegetative and floral characters of the following families (fifteen species among them) description, VS of flower, section of ovary, floral diagram/s, floral formula and systematic position according to Bentham & Hooker's system of classification: Euphorbiaceae - <i>Croton</i> Rubiaceae - <i>Dentella</i>	6
1 st week of June 2024		Internal Examination & Class for Slow Learners	3
June 2024	BOTACOR010T	Revision class, Class Tests	2
	BOTACOR10P	Revision Class, Class test	2
	BOTHGEC04T/BOTGCOR04T	Class Test	2
July 2024		END SEMESTER EXAMINATION	
Total Classes			56

NAME OF TEACHER: MR. RAJATESH CHAKRABORTY

PAPER ALLOTTED: MOLECULAR BIOLOGY (BOTACOR08T, BOTACOR08P);
PLANT SYSTEMATICS (BOTACOR10T, BOTACOR10P) PLANT PHYSIOLOGY
AND METABOLISM (BOTHGEC04T / BOTGCOR04T);
ETHNOBOTANY (BOTSSECO4M)

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	BOTACOR08T	Nucleic acids: Carriers of genetic information: DNA as the carrier of genetic information (Griffith's, Hershey & Chase, Avery, McLeod & McCarty, Fraenkel-Conrat's experiment) (UNIT-1) Central dogma and genetic code : Key experiments establishing the central dogma (adaptor hypothesis and discovery of mRNA template) (UNIT-4)	4
	BOTACOR08P	1. Preparation of LB medium 2. DNA isolation from cauliflower head	6

	BOTADSE10T	Systems of classification Major contributions of Theophrastus, Linnaeus, Hutchinson (UNIT-4)	2
	BOTADSE10P	1.Study of the vegetative and floral characters of the following families (fifteen species among them) description, VS of flower, section of ovary, floral diagram/s, floral formula and systematic position according to Bentham & Hooker's system of classification: Family : Malvaceae (<i>Sida & Hibiscus vitifolius</i>)	6
	BOTHGEC04T BOTGCOR04T	Respiration: Glycolysis, anaerobic respiration, TCA cycle; Oxidative phosphorylation (UNIT-5)	4
April 2024	BOTACOR08T	Central dogma and genetic code :Genetic code: salient features and deciphering (triplet binding assay) (UNIT-4) The replication of DNA : Chemistry of DNA synthesis (Kornberg's discovery); general principles – bidirectional, semi conservative and semi discontinuous replication, RNA priming(UNIT-3)	5
	BOTACOR08P	3.DNA estimation by diphenylamine reagent/UV Spectrophotometry. 4. Study of DNA replication mechanisms through photographs (Rolling circle, Theta replication and semi-discontinuous replication).	6
	BOTADSE10T	Systems of classification: Major contributions of Takhtajan and Cronquist; classification systems of Bentham and Hooker (up to series) and Engler and Prantl (up to series);	4
	BOTADSE10P	1.Study of the vegetative and floral characters of the following families (fifteen species among them) description, VS of flower, section of ovary, floral diagram/s, floral formula and systematic position according to Bentham & Hooker's system of classification: Family : Acanthaceae (<i>Ecbolium</i>) Family: lamiaceae (<i>Leonurous, Ocimum</i>)	9
	BOTHGEC04T BOTGCOR04T	Respiration: phosphorylation, Glyoxylate, Oxidative Pentose Phosphate Pathway. (UNIT-5)	4
	BOTSSEC04M	Ethnobotany and legal aspects: Ethnobotany as a tool to protect interests of ethnic groups. Sharing of wealth concept with few examples from India. Biopiracy, Intellectual Property Rights and Traditional Knowledge (UNIT-4)	4
May 2024	BOTACOR08T	The replication of DNA : various models of DNA replication, including rolling circle, θ	4

		(theta) mode of replication, replication of linear ds-DNA, replication of the 5' end of linear chromosome; Enzymes involved in DNA replication(UNIT-3)	
	BOTACOR08P	6. Photographs establishing nucleic acid as genetic material (Messelson and Stahl's, Avery et al, Griffith's, Hershey & Chase's and Fraenkel & Conrat's experiments)	3
	BOTADSE10T	Systems of classification: Brief reference of angiosperm phylogeny Group (APG III) classification. (UNIT-4) Phylogeny of Angiosperms Origin and evolution of angiosperms (Brief Idea). (UNIT-6)	4
	BOTADSE10P	1. Study of the vegetative and floral characters of the following families (fifteen species among them) description, VS of flower, section of ovary, floral diagram/s, floral formula and systematic position according to Bentham & Hooker's system of classification: Family: Rubiaceae (<i>Oldenlandia</i>) Family: Euphorbiaceae (<i>Euphorbia</i>)	6
	BOTHGEC04T BOTGCOR04T	Translocation in phloem Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading (UNIT-3)	4
	BOTSSEC04M		
June (1st week) 2024	BOTADSE10P	Botanical excursion: At different ecological zones (long Excursion)	
		Internal Examination & Class for Slow Learners	6
June 2024	BOTACOR08T	Enzymes involved in DNA replication(UNIT-3) Revision class & Class test	4
	BOTACOR08P	Revision class	3
	BOTADSE10T	Revision class & Class test	
	BOTADSE10P	1. Study of the vegetative and floral characters of the following families (fifteen species among them) description, VS of flower, section of ovary, floral diagram/s, floral formula and systematic position according to Bentham & Hooker's system of classification: Family: Polygonaceae (<i>Polygonum</i>) 2. Herbarium preparation 3. Preparation of Voucher book 4. preparation of Field note book 5. Botanical excursion: Field Visit (Local)	10
	BOTHGEC04T BOTGCOR04T	Revision class	2

July 2024		End Semester Examination	
Total			98

NAME OF TEACHER: DR. RAM PRASAD MUKHOPADHYAY

**PAPER ALLOTTED: PLANT ECOLOGY AND PHYTOGEOGRAPHY (BOTACOR09T,
BOTACOR09P), ETHNOBOTANY (BOTSSEC02M)**

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	BOTACOR09T	Water: Importance;states of water in the environment; atmospheric moisture; hydrological cycle; water in soil; water table. (UNIT-3)	4
	BOTACOR09P	Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter. (UNIT-1)	8
	BOTSSEC02M	Methodology of Ethnobotanical studies :a) Field work b) Herbarium c) Ancient Literature (Unit-2)	4
April 2024	BOTACOR09T	Light, temperature, wind and fire: Variations; adaptations of plants to their variation. (UNIT-4) Functional aspects of ecosystem: Principles and models of energy flow; production and productivity (UNIT-9)	5
	BOTACOR09P	Determination of pH of various soil and water samples (pH meter, universal indicator/Lovibond comparator and pH paper). (UNIT-2) Analysis for carbonates, chlorides, nitrates, organic matter and base deficiency from two soil samples by rapid field test. (UNIT-3)	8

	BOTSSEC02M	Methodology of Ethnobotanical studies :c) Ancient Literature d) Archaeological findings e) temples and sacred places	4
May 2024	BOTACOR09T	Functional aspects of ecosystem: ecological efficiencies; biogeochemical cycles; cycling of carbon, nitrogen and phosphorus. (UNIT-9) Phytogeography: Principles; continental drift and theory of tolerance (brief account); endemism. (UNIT-10)	5
	BOTACOR09P	Determination of organic carbon of different soil samples by Walkley& Black rapid titration method. (UNIT-4) Determination of dissolved oxygen and carbon dioxide of water samples from polluted and unpolluted sources. (UNIT-5)	8
	BOTSSEC02M	Revision	2
May (4th Week) 2024		Internal Examination & Class for Slow Learners	7
June 2024	BOTACOR09T	Phytogeography: Brief description of major terrestrial biomes – Tropical rain forest, Temperate grassland and Tundra; Phytogeographical division of India(BSI 1996); Local Vegetation. (UNIT-10) Revision Class &Class Test	5
	BOTACOR09P	Revision Class	4
July 2024		END SEMESTER EXAMINATION	
Total Classes			64