গড়গাঁও মহাবিদ্যালয়

GARGAON COLLEGE

NAAC accredited with 'B' Grade

Course Distribution
Department of Botany
2019-20

DEPARTMENT OF BOTANY, GARGAON COLLEGE

Course Distribution

Name of the Teacher: Mrs. Joya Saikia Goswami ; Designation: Associate Professor; Session: AUG - DEC 2019

Sl. No.	Semester	Subject	Stream	Paper Code	Unit
1	I	Microbiology and Phycology	HONS	C 1	Unit 4: Algae Unit 5: Cyanophyta, Chlorophyta, Xanthophyta and Charophyta Unit 6: Phaeophyta and Rhodophyta
		Biomolecules and Cell Biology	HONS	C 2	Unit 1: Biomolecules Unit 2: Bioenergetics Unit 3: Enzymes
		Biodiversity (Microbes, Algae, Fungi, Lichen and Archegoniate)	GE	GE 1	Unit 5: Introduction to Archegoniate Unit 6: Bryophytes Unit 7: Pteridophytes Unit 8: Gymnosperms
2	III	Pteridophytes, Gymnosperms and Palaeobotany	MAJOR	301	**Gymnopserms** Unit –1: Classification, distribution and economic importance. Unit –2: Comparative and evolutionary study of morphology, anatomy and reproduction of *Cycas, Pinus, Ginkgo* and *Gnetum.*
		Microbiology and Biotechnology	MAJOR	303	**Microbiology** Unit –1: Contribution of scientists for development of microbiology. Unit –2: Classification of micro-organisms and characteristic features of different groups of microorganisms, brief knowledge of bacteria, cyanobacteria, virus, bacteriophage, mycoplasma (Structure, reproduction and importance). Unit –3: Elementary principles of isolation, and cultivation of micro-organisms and pure culture concept; General ecology of soil microflora, mycorrhiza and bacteriorrhiza.
		Morphology, Taxonomy, Development and Reproduction of Angiosperms	NON - MAJOR	301	**Development and Reproduction** Unit–1: Meristems and organization of root and shoot apices;Tissues and tissue systems, the primary body, stealer structures Unit–2: The secondary growth: cambium and its derivatives, anomalous types, periderm. Unit–3:Microsporangium and development of male gametophyte; Megasporangium and development of female gametophyte. Unit–4: Embryo and Endosperm development.

3	V	Development and Reproduction in Angiosperm	MAJOR	501	**Development in Angiosperm** Unit–1: Organisation of tissues: Types of tissues, Meristematic and permanent, their types, structures, distribution and functions; theories of differentiation of roots and shoots. Unit –2: Stelar Body – origin and development, Root – stem transition, leaf traces and leaf gaps, branch gaps, abcission layer. Unit –3: Secondary structures of roots and stems, intiation of cambium and its activities. 4 class hours Unit–4: Anomalous secondary growth in thickness (*Amaranthus, Asparagms, Boerharia and Mirabilis*). Unit–5:Anatomico–physiological consideration of dermal, mechanical, conducting and photosynthetic system of tissues; anatomy of C3 and C4 plants.
			MAJOR		**Reproduction in Angiosperm** Unit –1: A general account of the following topics: Development of male and female gametophyte of angiosperms; monosporic, bisporic & tetrasporic embryosac. Unit –2: Fertilization, development of embryo; Apomixis, polyembryony, Palynology. Unit –3: Development of Endosperm – nuclear, cellular, helobial; haustorial structures.

Head
Department of Botany
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Course Distribution

Name of the Teacher: Dr. Dimbeshwar Das; Designation: Assistant Professor; Session: AUG - DEC 2019

Sl. No.	Semester	Subject	Stream	Paper Code	Unit
1	I	Microbiology and Phycology	HONS	C 1	Unit 1: Introduction to microbial world Unit 2: Bacteria Unit 3: Viruses
		Biomolecules and Cell Biology	HONS	C 2	Unit4: The cell, Cell wall and plasma membrane Unit 5: Cell organelles Unit 6: Cell division
		Biodiversity (Microbes, Algae, Fungi, Lichen and Archegoniate)	GENERIC	GE 1	Unit 1: Microbes Unit 2: Algae Unit 3: Fungi Unit 4: Lichen
2	III	Pteridophytes, Gymnosperms and Palaeobotany	MAJOR	301	**Pteridophytes** Unit –1: General classification, organisation and affinities, distribution in India and economic importance
					Unit –2: Stelar organisation in Pteriodophytes; Evolution of sporophytes and sporophylls in Pteriodophytes; Homospory and Heterospory and its importance in evolution of seed habit
					Unit –3: Comparative study of morphology and life history of *Psilotum, Lycopodium, Selaginella, Equisetum, Marsilea*
					Palaeobotany Unit –1: An elementary knowledge of paleobotany – process and the theory of fossilization, geological periods and importance of Paleobotany
		Pteridophytes, Gymnosperms and Palaeobotany	MAJOR	301	Unit –2: General account of anatomy and reproduction of the following types: (a) Pteridophytes – *Rhynia, Hornea, Psilophyton, Sphenophyllum* (b) Gymnosperms – Cycadefilicales (*Lyginopteris*), Bennettitales (*Willimasonia*) and Cordaitales (*Cordaites*)
		Microbiology and Biotechnology	MAJOR	303	**Microbiology** Unit –4: Microbiology of food, milk and water
					Unit –5: Importance of micro-organisms for human welfare, elementary knowledge of disease caused by microbes to man, and plants (only two diseases from each group, mentioning causal organism, symptoms and control measures).
					Biotechnology Unit – 1: Introduction, scope of biotechnology, recent advances in biotechnology, application of biotechnology in agriculture and industry, concepts pertaining to biofertilizers
					Unit – 2: Genetic Engineering and its merits and demerits
					Unit – 3: Tissue culture: basic principle, medium, protoplast fusion and somatic hybridization
					Unit – 4: Basic knowledge of industrial microbiology with reference to production of Alcohol, Vinegar and Antibiotic.

		Morphology, Taxonomy, Development and Reproduction of Angiosperms	NON - MAJOR	301	**Morphology & Taxonomy** Unit –1: Knowledge of the principles of classifications of angiosperms; salient features of system of classification proposed by Linnaeus, Bentham and Hooker and Engler and Prantl's. Unit–2: Nomenclature- morphological details, diagram and floral formula of angiospermic species of the following families citing common and economically plants. Unit–3:Magnoliaceae, Brassicaceae, Malvaceae, Fabaceae, Rosaceae, Apiaceae, Lamiaceae, Euphorbiaceae; Orchidiaceae, Musaceae, Lilliaceae, Arecaceae and Poaceae.
3	V	Genetics & Plant Breeding, Biostatistics	MAJOR	503	**Genetics** Unit – 1: Mendel's Laws, their critical appreciation, gene interactions and modified monohybrid and dihybrid ratios; concept of alleles, multiple alleles and multiple genes, Linkage, Crossing Over and basic knowledge of Gene Mapping. Unit – 2: Determination of Sex, Sex Linked and Sex Limited Traits, Cytoplasmic Inheritance with reference to Plastid Inheritance and Kappa Particle Inheritance. Unit – 3: Chromosomal (numerical and structural) and Gene Mutation, concept of Biochemical Mutation. Unit – 4: Basic ideas of Gene and its fine structure, Genetic Engineering and Gene Cloning, Concept Trans Gene. Unit – 5: Human Genetics: Karyotype, impatant Syndromes and disorders
					Plant Breeding Unit – 1: Methods of reproduction: Sexual, Vegetative, apomixes; Principles and methods of Plant Breeding: Introduction, Selection, Hybridization, Heterosis Breeding and concept of Mutation Breeding. Unit – 2: In vitro Culture: Requirements, techniques and application in Crop Improvement.
					Biostatistics Unit –1: Application of statistics in Biological Science, collection and classification of data for frequency distribution. Unit –2: Measurement of Central Tendency; Mean, Media , Mode, Standard Error and Standard Deviation. Unit –3: Test of Significance, Probability Test.

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Name of the Teacher: Mrs. Joya Saikia Goswami ; Designation: Associate Professor; Session: JAN - JUNE 2020

Sl. No.	Semester	Subject	Stream	Paper Code	Unit
1	II	Mycology and Phytopathology	HONS	C 3	Unit 1: Introduction to fungi Unit 2: Chytridiomycota, Zygomycota, Ascomycota and Basidiomycota, Bioluminescence, Fairy Rings and Mushroom Cultivation. Unit 3: Allied Fungi and Oomycota General characteristics; Status of Slime molds, Classification;
		Archegoniate	HONS	C 4	Unit 4: Type Studies- Pteridophytes Classification (up to family), morphology, anatomy and reproduction of *Psilotum, Selaginella, Equisetum and Ophioglossium, Marselia*. Apogamy and apospory, heterospory andseed habit, telome theory, stelar evolution; Ecological and economic importance. Unit 5: Gymnosperms General characteristics, classification (up to family), morphology, anatomy and reproduction of *Cycas, Pinus , Ginkgo and Gnetum* (Developmental details not to be included); Ecological and economic importance. Unit 6: Fossil plants Process of fossilization; Early land plants (*Psilophyton and Rhynia*), *Cycadeoidea, Sphenophyllum*
		Plant Ecology and Taxonomy	HONS	GE 2	Unit 1: Introduction Unit 2: Ecological factors Unit 3: Plant communities Unit 4: Ecosystem Unit 5: Phytogeography
2	IV	Morohology and Taxonomy of Angiosperms	MAJOR	401	**Morphology of Angiosperms** Unit –1: Detail study of Morphological characters: (i) Carpel polymorphism (ii) Origin of angiosperms (iii) Evolution of inflorescence (iv) Role of morphology in the classification of the flowering plants
		Cell Biology and Modern Laboratory Technique	MAJOR	403	**Cell Biology** Unit–1: Cell theory and its exceptions, prokaryotic and eukaryotic cells.
					Unit–2: Cell organisation: Cell wall, its formation and growth, plasma membrane, chemical organisation and function; protoplast, Cell-sap, Plasmodesmata, ergastic substance, cell organelles, structure, origin and function of mitochondria, nucleus, chromosome – special types of chromosomes, plastids with reference to chloroplast, golgi bodies, endoplasmic reticulum, ribosome and lysosome.
					Unit –3: Cell formation – amitosis, mitosis, and meiosis, and cell cycle.
					Unit –4: Nucleoproteins and nature of genetic material

					Unit –5: Cell Adhesion, Membrane Transport, Signal Transduction (G proteins).
		Physiology & Economic Botany	NON - MAOR	401	Physiology Unit–4: Photosynthesis: mechanism and factors affecting photosynthesis, Calvin Cycle, carbon fixation in Calvin Cycle. Unit–5: Respiration: mechanism (Glycolysis & Kreb Cycle) and significance of respiration; fermantation; growth and development: definations, phases of growth and development; dormancy and germination of seeds. Unit–6: Hormones: Auxin, Gibberellin, Cytokinins, Florigen; concept of photoperiodism and vernalisation; tropic and nastic movement.
3	VI	Plant Physiology	MAJOR	601	Unit –1: Plant water relationships
					Unit –2: Ascent of sap
					Unit –3: Nitrogen Metabolism
					Unit –4: Photosynthesis
					Unit –5:Respiration
					Unit – 6: Growth and Development
		Agrotechnology and Sustainable Utilization of Plants	MAJOR	606	Unit -1: Origin of cultivated plants, ethnobotany and its importance in Indian context, Knowledge on Indigenous Knowledge System (IKS)
					Unit – 2: Agrotechnology of rice, wheat, mustard, sunflower, sesume, groundnut, soyabean, gram, mung, pea, tea, coffee, potato, cabbage, cauliflower, tomato and their economic utilization
					Unit – 5: Aromatic and Petrocrops (Cultivation and economic utilization) of patchouli, citronella, vitivar, sasi, jatropha, era.

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Name of the Teacher: Dr. Dimbeshwar Das; Designation: Assistant Professor; Session: JAN - JUNE 2020

Sl. No.	Semester	Subject	Stream	Paper Code	Unit
1	II	Mycology and Phytopathology	HONS	C 3	Unit 4: Symbiotic associations, Lichen Unit 5: Applied Mycology Unit 6: Phytopathology
		Archegoniate	HONS	C 4	Unit 1: Introduction , Unifying features of archegoniates; Transition to land habit; Alternation of generations. Unit 2: Bryophytes, General characteristics; Adaptations to land habit; Classification; Range of thallus organization. Unit 3: Type Studies- Bryophytes
		Plant Ecology and Taxonomy	GENERIC	GE 2	Unit 6: Introduction to plant taxonomy Unit 7: Identification , Functions of Herbarium, important herbaria and botanical gardens of the world and India; Documentation: Flora, Keys: single access and multi-access Unit 8: Taxonomic evidences from palynology, cytology, phytochemistry and molecular data. Unit 9: Taxonomic hierarchy, Ranks, categories and taxonomic groups Unit 10 Botanical nomenclature Unit 11 Classification, Types of classification- artificial, natural and phylogenetic. Bentham and Hooker (upto series), Engler and Prantl (upto series). Unit 12 Biometrics, numerical taxonomy and cladistics, Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences).
2	IV	Morohology and Taxonomy of Angiosperms	MAJOR	401	**Taxonomy of Angiosperms** Unit –1: History of plant classification, its aims and objectives, outlines of the main classifications (systems of classification) – Artificial, Natural, Phylogenetic and Modern with special reference to Linnaeus, Bentham and Hooker, Engler and Prantl, Hutchinson and Takhtajan's classification.
					Unit –2: Generic names, specific epithets, citation and authority, binomial nomenclature, taxonomic keys; typification and priority; importance of herbarium specimens and their preparations; role of herbaria and botanical gardens; documentation (floras, monographs, manuals, journals, abstracts, indices and dictionaries).
					Unit –3: Details on Cytotaxonomy, Chemotaxonomy, Numerical Taxonomy and Biosystematics.

					Unit–4: A detailed knowledge of the following families and their phylogenetic affinities and economically important plants: Dicotyledons: Magnoliaceae, Malvaceae, Rubiaceae, Fabaceae, Rosaceae, Solanaceae, Cucurbitaceae, Apiaceae, Asteraccae, Lamiaceae, Theaceae, Apocynaceae and Euphorbiaceae Monocotyledons : Orchidaceae, Musaceae, Zingiberaceae, Arecaceae and Poaceae, Commelinaceae, Cyperaceae
		Cell Biology and Modern Laboratory Technique	MAJOR	403	**Modern Laboratory Technique** Unit –1: Working principles, operations and application of the following in biological sciences: a. Microscopy: Compound, Phase Contrast, Dark Field and Electron microscopes. b. Separation Techniques of Biomolecules: Paper Chromatography, TLC, HPLC, Gel Filtration, Centrifuge. c. Colorimeter and Spectrophotometer. d. PH meter, BOD incubator, Autoclave, Laminar Air Flow, Hot Air Oven. e. Basic knowledge of Computer and its application in biological science.
		Physiology & Economic Botany	NON-MAJOR	401	**Physiology** Unit–1: An elementary knowledge; importance of water to plant life, diffusion, imhibition, osmosis and plasmolysis; absorption of water and solutes. Unit–2: Micro nutrition: Essential macro and micro elements and their role, transportation and exudation, ascent of sap and translocation. Unit–3: Enzymes, co-enzymes and their role in biochemical processes.
					Economic Botany Unit –1: A general knowledge of the following economically important plants with reference to their local names, scientific names and parts used. a. Cereals–Rice, Wheat and Maize. b. Pulses – Pea and Soyabean. c. Oil seeds – Mustard, Ground Nut, Coconut and Sunflower. d. Fibre Yielding Plants – Jute, Cotton, Ramie. e. Medicinal Plants – Rauvolvia, Swertia, Ocimum and Neem. f. Timber yielding Plants – Sal, Sissoo, Teak, Holokh. g. Non-alcoholic Beverages – Tea and Coffee.
3	VI	Molecular Biology and Immunology	MAJOR	603	**Molecular Biology** Unit 1: Nucleic Acids
					Unit–2: Replication of DNA
					Unit–3: Features of genetic code
					Unit–4: Recombination in Prokaryotes
					Unit–3: Features of genetic code
					Immunology Unit –1: Plant health management
					Unit –2: Immunity & resistant in mammals, principle of antigens and Antibodies reaction
					Unit–3: Interaction of plants with bacteria, virus and fungi
		Biophysics and Bioinformatics	MAJOR	604	**Biophysics** Unit –1: Scope and development of Biophysics

					Unit –2: Laws of Thermodynamics
					Unit–3: X-ray Crystallography (XRD), Chromatography, LASER and its biological applications, Flurences and its application, Basic concept of NMR and Ultra Sound
					Unit –3:Isotopes
					Bioinformatics Unit-1: Fundamentals of bioinformatics
					Unit-2: Biological database
					Unit-3. Database search and sequence alignment
					Unit-4: Phylogenetic analysis
		Agrotechnology and Sustainable Utilization of Plants	MAJOR	606	Unit – 3: Agrotechnology of Chilli, turmeric, zinger, cardamom, black piper, jute, cotton, ramie, bamboo, teak, sal, sisoo, ajar, nahar and their economic utilization.
					Unit – 4: Medicinal importance of sarpagandha, ashwagandha, kalmegh, satmul, bos, giloi (Tinospora), bhot jalakia, amlakhi, arjun, silikha and their economic utilization
					Unit – 6: Domestication of Plants; Germplasm Collection & Conservation, Importance of Germplasm of Wild Species:Gene Library, Gene Bank; Concept of , Biofertilizers, biopesticides and Organic farming; Useful aspect of Lower Group of Plants: Algae, Fungi, Lichen.

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