



গড়গাঁও মহাবিদ্যালয়
GARGAON COLLEGE

**TEACHING PLAN
DEPARTMENT OF BOTANY
JULY 2019-JUNE 2020**

Teaching Plan

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

Sl. No.	Semester	Subject	Stream	Paper Code	Unit	Teaching Methodology	Work Laod	Learning Outcome
1	I	Microbiology and Phycology	HONS	C 1	Unit 4: Algae Unit 5: Cyanophyta, Chlorophyta, Xanthophyta and Charophyta Unit 6: Phaeophyta and Rhodophyta	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	7 Hrs/Week	The objective of this course is to provide knowledge to the students on various forms of microbes and algae - their characteristics and economic importance.
		Biomolecules and Cell Biology	HONS	C 2	Unit 1: Biomolecules Unit 2: Bioenergetics Unit 3: Enzymes	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips		The objective of this course is to expose the students on molecular organisations life and also discusses cellular and molecular processes of life.
		Biodiversity (Microbes, Algae, Fungi, Lichen and Archegoniate)	GE	GE 1	Unit 5: Introduction to Archegoniate Unit 6: Bryophytes Unit 7: Pteridophytes Unit 8: Gymnosperms	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars and Class tests.	4 Hrs/Week	The objective of this course is to expose the students to different forms of plant life
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 <i>Cycas</i> , <i>Pinus</i> , <i>Ginkgo</i> and <i>Gnetum</i> .	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	9 Hrs/Week	To provide comparative account of structural morphology, distribution anatomy, reproduction and evolution of seed habit in higher cryptograms; special emphasis is to be given on the stelar structure and evolutionary links

		Microbiology and Biotechnology	MAJOR	303	<p>Microbiology</p> <p>Unit –1: Contribution of scientists for development of microbiology.</p> <p>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).</p> <p>Unit –3: Elementary principles of isolation, and cultivation of micro-organisms and pure culture concept; General ecology of soil microflora, mycorrhiza and bacteriorrhiza.</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars and Class tests.	To introduce the students with the basic knowledge of microbiology and biotechnology in the light of recent developments
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		Morphology, Taxonomy, Development and Reproduction of Angiosperms	NON - MAJOR	301	<p>Development and Reproduction</p> <p>Unit-1: Meristems and organization of root and shoot apices;Tissues and tissue systems, the primary body, stealer structures</p> <p>Unit-2: The secondary growth: cambium and its derivatives, anomalous types, periderm.</p> <p>Unit-3:Microsporangium and development of male gametophyte; Megasporangium and development of female gametophyte.</p> <p>Unit-4: Embryo and Endosperm development.</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars and Class tests.	5 Hrs/Week	To introduce the undergraduate students with the terminologies used in description of angiospermic plants, basic knowledge of plant classification, tissues & tissue systems, development of primary & secondary plant bodies and development of male & female reproductive components & their functions.
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3	V	Development and Reproduction in Angiosperm	MAJOR	501	<p>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, abscission layer. Unit –3: Secondary structures of roots and stems, initiation of cambium and its activities. 4 class hours Unit–4: Anomalous secondary growth in thickness (<i>Amaranthus</i>, <i>Asparagms</i>, <i>Boerharia</i> and <i>Mirabilis</i>). Unit–5:Anatomico–physiological consideration of dermal, mechanical, conducting and photosynthetic system of tissues; anatomy of C3 and C4 plants.</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars and Class tests.	12 Hrs/Week	To provide fundamental knowledge of structural and functional aspects of cell and cell organelles and the tools and techniques used in modern biological study
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			MAJOR	<p>Reproduction in Angiosperm</p> <p>Unit –1: A general account of the following topics: Development of male and female gametophyte of angiosperms; monosporic, bisporic & tetrasporic embryosac.</p> <p>Unit –2: Fertilization, development of embryo; Apomixis, polyembryony, Palynology.</p> <p>Unit –3: Development of Endosperm – nuclear, cellular, helobial; haustorial structures.</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars and Class tests.	
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J. S. K. K. K.

Head
Department of Botany
Gargaon College, Simaluguri
Dist. Sivasagar, Pin 785686, Assam

Teaching Plan

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

Sl. No.	Semester	Subject	Stream	Paper Code	Unit	Teaching Methodology	Work Load	Learning Outcome
1	I	Microbiology and Phycology	HONS	C 1	Unit 1: Introduction to microbial world Unit 2: Bacteria Unit 3: Viruses	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	8 Hrs/Week	The objective of this course is to provide knowledge to the students on various forms of microbes and algae - their characteristics and economic importance.
		Biomolecules and Cell Biology	HONS	C 2	Unit4: The cell, Cell wall and plasma membrane Unit 5: Cell organelles Unit 6: Cell division	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips		The objective of this course is to expose the students on molecular organisations life and also discusses cellular and molecular processes of life.
		Biodiversity (Microbes, Algae, Fungi, Lichen and Archegoniate)	GENERIC	GE 1	Unit 1: Microbes Unit 2: Algae Unit 3: Fungi Unit 4: Lichen	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars and Class tests.	4 Hrs/Week	The objective of this course is to expose the students to different forms of plant life
2	III	Pteridophytes, Gymnosperms and Palaeobotany	MAJOR	301	Pteridophytes Unit –1: General classification, organisation and affinities, distribution in India and economic importance	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	11 Hrs/Week	To provide comparative account of structural morphology, distribution anatomy, reproduction and evolution of seed habit in higher cryptograms;


					<p>Unit –2: Stelar organisation in Pteridophytes; Evolution of sporophytes and sporophylls in Pteridophytes; Homospory and Heterospory and its importance in evolution of seed habit</p> <p>Unit –3: Comparative study of morphology and life history of <i>Psilotum</i>, <i>Lycopodium</i>, <i>Selaginella</i>, <i>Equisetum</i>, <i>Marsilea</i></p>			special emphasis is to be given on the stelar structure and evolutionary links
		Pteridophytes, Gymnosperms and Palaeobotany	MAJOR	301	<p>Palaeobotany Unit –1: An elementary knowledge of paleobotany – process and the theory of fossilization, geological periods and importance of Paleobotany</p> <p>Unit –2: General account of anatomy and reproduction of the following types: (a) Pteridophytes – <i>Rhynia</i>, <i>Hornea</i>, <i>Psilophyton</i>, <i>Sphenophyllum</i> (b) Gymnosperms – Cycadefilicales (<i>Lyginopteris</i>), Bennettitales (<i>Willimasonia</i>) and</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	11 Hrs/Week	To provide comparative account of structural morphology, distribution anatomy, reproduction and evolution of seed habit in higher cryptograms; special emphasis is to be given on the stelar structure and evolutionary links

					Cordaitales (<i>Cordaites</i>)			
		Microbiology and Biotechnology	MAJOR	303	<p>Microbiology Unit –4: Microbiology of food, milk and water</p> <p>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).</p> <p>Biotechnology Unit – 1: Introduction, scope of biotechnology, recent advances in biotechnology, application of biotechnology in agriculture and industry, concepts pertaining to biofertilizers</p> <p>Unit – 2: Genetic Engineering and its merits and demerits</p> <p>Unit – 3: Tissue culture: basic principle, medium, protoplast fusion and somatic hybridization</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	11Hrs/Week	To introduce the students with the basic knowledge of microbiology and biotechnology in the light of recent developments

					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	<p>Morphology & Taxonomy</p> <p>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.</p> <p>Unit–2: Nomenclature-morphological details, diagram and floral formula of angiospermic species of the following families citing common and economically plants.</p> <p>Unit–3: Magnoliaceae, Brassicaceae, Malvaceae, Fabaceae, Rosaceae, Apiaceae, Lamiaceae, Euphorbiaceae; Orchidiaceae, Musaceae, Lilliaceae, Arecaceae and Poaceae.</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	6 Hrs / Week	To introduce the undergraduate students with the terminologies used in description of angiospermic plants, basic knowledge of plant classification, tissues & tissue systems, development of primary & secondary plant bodies and development of male & female reproductive components & their functions.

3	V	Genetics & Plant Breeding, Biostatistics	MAJOR	503	<p>Genetics</p> <p>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.</p> <p>Unit – 2: Determination of Sex, Sex Linked and Sex Limited Traits, Cytoplasmic Inheritance with reference to Plastid Inheritance and Kappa Particle Inheritance.</p> <p>Unit – 3: Chromosomal (numerical and structural) and Gene Mutation, concept of Biochemical Mutation.</p> <p>Unit – 4: Basic ideas of Gene and its fine structure, Genetic Engineering and Gene Cloning, Concept Trans Gene.</p> <p>Unit – 5: Human Genetics: Karyotype, impatant Syndromes and disorders</p>	Lecture Method, Audio-Visual Aids, Student Seminars, Class tests and Practical based classes	26 Hrs / Week	To introduce the students with the basic knowledge on plant genetics and application of genetic for improvement of crop, application of statistics in biology.
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					<p>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.</p> <p>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.</p>			
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Dist. Sivasagar, Pin 785686, Assam

Teaching Plan

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

Sl. No.	Semester	Subject	Stream	Paper Code	Unit	Teaching Methodology	Work Laod	Learning Outcome
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;	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	6 Hrs/Week	The objective of this course is to expose the students on the fungal world, different fungal diseases; their economic importance, etc.

		Archegoniate	HONS	C 4	<p>Unit 4: Type Studies- Pteridophytes Classification (up to family), morphology, anatomy and reproduction of <i>Psilotum</i>, <i>Selaginella</i>, <i>Equisetum</i> and <i>Ophioglossium</i>, <i>Marselia</i>. Apogamy and apospory, heterospory and seed habit, telome theory, stelar evolution; Ecological and economic importance.</p> <p>Unit 5: Gymnosperms General characteristics, classification (up to family), morphology, anatomy and reproduction of <i>Cycas</i>, <i>Pinus</i>, <i>Ginkgo</i> and <i>Gnetum</i> (Developmental details not to be included); Ecological and economic importance.</p> <p>Unit 6: Fossil plants Process of fossilization; Early land plants (<i>Psilophyton</i> and <i>Rhynia</i>), <i>Cycadeoidea</i>, <i>Sphenophyllum</i></p>	<p>Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Field Trips</p>	<p>The objective of this course is to expose the students on Bryophyte, Gymnosperms and Fossil Plants</p>
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		Plant Ecology and Taxonomy	HONS	GE 2	Unit 1: Introduction Unit 2: Ecological factors Unit 3: Plant communities Unit 4: Ecosystem Unit 5: Phytogeography	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars and Class tests.	4 Hrs/Week	The objective of this course is to expose the students to interaction of plant life with the surroundings and also to identification, classification and nomenclature of plants
2	IV	Morphology 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	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	7 Hrs/Week	To expose the students to interaction of plant with its surroundings and also the geographic distribution of different plants
		Cell Biology and Modern Laboratory Technique	MAJOR	403	Cell Biology Unit–1: Cell theory and its exceptions, prokaryotic and eukaryotic cells.	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars and Class tests.		To provide fundamental knowledge of structural and functional aspects of cell and cell organelles and the tools and techniques used in modern biological study.

				<p>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.</p>			
				<p>Unit -3: Cell formation – amitosis, mitosis, and meiosis, and cell cycle.</p>			
				<p>Unit -4: Nucleoproteins and nature of genetic material</p>			

					Unit –5: Cell Adhesion, Membrane Transport, Signal Transduction (G proteins).	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars and Class tests.	4 Hrs/Week	To introduce the undergraduate students with the basic knowledge of physiological activities of plants through the mechanisms of absorption of inorganic components & production and functions of organic components & role of external factors upon them.
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		Physiology & Economic Botany	NON - MAOR	401	<p>Physiology</p> <p>Unit-4: Photosynthesis: mechanism and factors affecting photosynthesis, Calvin Cycle, carbon fixation in Calvin Cycle.</p> <p>Unit-5: Respiration: mechanism (Glycolysis & Krebs Cycle) and significance of respiration; fermentation; growth and development: definitions, phases of growth and development; dormancy and germination of seeds.</p> <p>Unit-6: Hormones: Auxin, Gibberellin, Cytokinins, Florigen; concept of photoperiodism and vernalisation; tropic and nastic movement.</p>			
3	VI	Plant Physiology	MAJOR	601	<p>Unit -1: Plant water relationships</p> <p>Unit -2: Ascent of sap</p> <p>Unit -3: Nitrogen Metabolism</p> <p>Unit -4: Photosynthesis</p> <p>Unit -5:Respiration</p> <p>Unit - 6: Growth and Development</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars and Class tests	11 Hrs/Week	To introduce the students with the basic knowledge on major physiological aspects of plants

		Agrotechnology and Sustainable Utilization of Plants	MAJOR	606	<p>Unit -1: Origin of cultivated plants, ethnobotany and its importance in Indian context, Knowledge on Indigenous Knowledge System (IKS)</p> <p>Unit – 2: Agrotechnology of rice, wheat, mustard, sunflower, sesame, groundnut, soyabean, gram, mung, pea, tea, coffee, potato, cabbage, cauliflower, tomato and their economic utilization</p> <p>Unit – 5: Aromatic and Petrocrops (Cultivation and economic utilization) of patchouli, citronella, vitivar, sasi, jatropa, era.</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips		To provide students comprehensive knowledge of usefulness of plant resources for human welfare
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J. K. K. K.

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Teaching Plan

Name of the Teacher: Dimbeshwar Das; Designation: Assistant Professor; Session: JAN – JUNE 2020

Sl. No.	Semester	Subject	Stream	Paper Code	Unit	Teaching Methodology	Work Laod	Learning Outcome
1	II	Mycology and Phytopathology	HONS	C 3	Unit 4: Symbiotic associations, Lichen Unit 5: Applied Mycology Unit 6: Phytopathology	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	8 Hrs/Week	The objective of this course is to expose the students on the fungal world, different fungal diseases; their economic importance, etc.
		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	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips		The objective of this course is to expose the students on Bryophyte, Gymnosperms and Fossil Plants

		Plant Ecology and Taxonomy	GENERIC	GE 2	<p>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</p> <p>Unit 8: Taxonomic evidences from palynology, cytology, phytochemistry and molecular data.</p> <p>Unit 9: Taxonomic hierarchy, Ranks, categories and taxonomic groups</p> <p>Unit 10 Botanical nomenclature</p> <p>Unit 11 Classification, Types of classification- artificial, natural and phylogenetic. Bentham and Hooker (upto series), Engler and Prantl (upto series).</p> <p>Unit 12 Biometrics, numerical taxonomy and cladistics, Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences).</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars and Class tests.	4 Hrs/Week	The objective of this course is to expose the students to interaction of plant life with the surroundings and also to identification, classification and nomenclature of plants
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2	IV	Morphology and Taxonomy of Angiosperms	MAJOR	401	<p>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.</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	12 Hrs/Week	To provide fundamentals of Angiosperm morphology and classification with special reference to the polygenerid relationship of various taxa.
					<p>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).</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips		
					<p>Unit –3: Details on Cytotaxonomy, Chemotaxonomy, Numerical Taxonomy and Biosystematics.</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips		

				<p>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, Asteraceae, Lamiaceae, Theaceae, Apocynaceae and Euphorbiaceae Monocotyledons : Orchidaceae, Musaceae, Zingiberaceae, Arecaceae and Poaceae, Commelinaceae, Cyperaceae</p>	<p>Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips</p>		
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		Cell Biology and Modern Laboratory Technique	MAJOR	403	<p>Modern Laboratory Technique Unit</p> <p>–1: Working principles, operations and application of the following in biological sciences:</p> <p>a. Microscopy: Compound, Phase Contrast, Dark Field and Electron microscopes.</p> <p>b. Separation Techniques of Biomolecules: Paper Chromatography, TLC, HPLC, Gel Filtration, Centrifuge.</p> <p>c. Colorimeter and Spectrophotometer.</p> <p>d. PH meter, BOD incubator, Autoclave, Laminar Air Flow, Hot Air Oven.</p> <p>e. Basic knowledge of Computer and its application in biological science.</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	12 Hrs/Week	To provide fundamental knowledge of structural and functional aspects of cell and cell organelles and the tools and techniques used in modern biological study.
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		Physiology & Economic Botany	NON- MAJOR	401	<p>Physiology Unit–1: An elementary knowledge; importance of water to plant life, diffusion, imhitation, 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.</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	5 Hrs/Week	To introduce the undergraduate students with the basic knowledge of physiological activities of plants through the mechanisms of absorption of inorganic components & production and functions of organic components & role of external factors upon them.
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					<p>Economic Botany Unit –1: A general knowledge of the following economically important plants with reference to their local names, scientific names and parts used.</p> <p>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.</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips		To introduce the undergraduate students with the basic knowledge of physiological activities of plants through the mechanisms of absorption of inorganic components & production and functions of organic components & role of external factors upon them.
3	VI	Molecular Biology and Immunology	MAJOR	603	<p>Molecular Biology Unit 1: Nucleic Acids</p> <p>Unit–2: Replication of DNA</p> <p>Unit–3: Features of genetic code</p>	Lecture Method, Audio-Visual Aids, Student Seminars, Class tests and Practical based classes	26 Hrs/Week	To introduce the students with the fundamentals of molecular biology and immunology

				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	Lecture Method, Audio-Visual Aids, Student Seminars, Class tests and Practical based classes Lecture Method, Audio-Visual Aids, ICT Tools, Bioinformatics	To expose the students to different statistical tools for Biological data analysis

				Unit-2: Biological database	Software, Student Seminars, Class tests and Practical based classes		
				Unit-3. Database search and sequence alignment			
				Unit-4: Phylogenetic analysis			
		Agrotechnology and Sustainable Utilization of Plants	MAJOR	606	<p>Unit – 3: Agrotechnology of Chilli, turmeric, zinger, cardamom, black piper, jute, cotton, ramie, bamboo, teak, sal, sisoo, ajar, nahar and their economic utilization.</p> <p>Unit – 4: Medicinal importance of sarpagandha, ashwagandha, kalmegh, satmul, bos, giloi (Tinospora), bhot jalakia, amlakhi, arjun, silikha and their economic utilization</p>	Lecture Method, Audio-Visual Aids, Practical based classes, Student Seminars, Class tests and Filed Trips	To provide students comprehensive knowledge of usefulness of plant resources for human welfare

				<p>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.</p>		
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