ATTENDANCE OF THE 22ND MEETING OF THE BOARD OF STUDIES OF THE BOTANY DEPARTMENT HELD ON 9 DECEMBER, 2023

The 22nd Meeting of the Board of Studies (BoS) of the Botany Department was held on December, 2023 in which the following members were present:

1. Dr. A.E. Dulip Daniels (Head) - Chairperson
2. Dr. M. Reginald
3. Dr. J. Lohidas
4. Dr. J. Irene Wilsy
5. Dr. B. Christudhas Williams
6. Dr. S. Thambi Raj
7. Dr. S. Jeeva
8. Dr. C.P. Ben
9. Dr. V.P. Shamal
10. Dr. Avvai M.S. Vijaya
11. Dr. Lini, J.J.
12. Dr. T.S. Shynin Brintha
13. Dr. V. Manimekalai (VC Nominee)
14. Dr. M. Johnson (Subject Expert)
15. Dr. A. Saravana Ganthi (Subject Expert)

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MINUTES OF THE 22ND MEETING OF THE BOARD OF STUDIES OF THE DEPARTMENT OF BOTANY & RESEARCH CENTRE HELD ON 9 DECEMBER, 2023

The 22nd meeting of the board The board of studies of the Department of Botany and Research Centre was held on 9 December, 2023, chaired by Dr. A.E. Dulip Daniels, the Head of the Department. The University nominee Dr. V. Manimekalai, subject experts Dr. M. Johnson and Dr. A. Saravana Ganthi and the entire faculty were present. The meeting started at 10.00 am in the Department. Dr. Daniels welcomed the members and the meeting proceeded as per the agenda. The minutes of the previous Board of Studies meeting was read and passed. Subsequently, the action taken report was also analysed and ratified.

The syllabi is basically TANSCHE fitted into the framework provided by the College adopted from the UGC Curriculum. Eighty percent of the syllabi was revised which includes introduction of new papers and change of topics in the Units of existing papers. Detailed discussions were made on the syllabi and suggestions were made by the participants which are recorded below.

<table>
<tr><th>Minute No.</th><th>Minutes</th></tr>
<tr><td>1.</td><td>Confirmation of the Minutes of the 21th BoS meeting held on 24.6.2023
Chairperson Dr. A.E. Dulip Daniels read the minutes of the 21st BoS meeting held on 24.6.2023 and the minutes were confirmed.</td></tr>
<tr><td>2.</td><td>Action Taken Report on the Minutes of the 21st BoS meeting.
The members of BoS carefully perused the "Action Taken Report (ATR)" presented by the Chairperson Dr. A.E. Dulip Daniels and expressed their satisfaction and appreciation.</td></tr>
<tr><td>3.</td><td>Introduction of new courses from the academic year 2023-'24.
Dr. A.E. Dulip Daniels proposed the introduction of the following eight NEW course(s) in the curriculum of B.Sc./M.Sc. Botany from the academic year 2023-'24 based on TANSCHE. He also proposed the introduction of two value-added courses namely Micro-propagation of Plants and Bio-control Agents in collaboration with Finura Agro Tech LLP in Semester II for both UG and PG common to all after regular hours.
<table>
<tr><th>Name of the Course</th><th>Course Code</th><th>Relevance to local, national, regional and global development needs</th></tr>
<tr><td>For UG
CCE-3
Bionanotechnology</td><td>-</td><td>Global
Bionanotechnology is a science where nanotechnology and biology converge. The field applies the tools of nanotechnology to biological problems, creating specialized applications in medicine, pharmaceuticals, agriculture, horticulture etc. which are world-wide.</td></tr>
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	SEC-2 Fermentation Technology		**Regional/Global** Fermentation Technology has industrial and agricultural applications such as the production of enzymes, pharmaceuticals, energy, food and feedstock, bioactive compounds, biopolymers, etc., in which different microorganisms, and including filamentous fungi are involved which are regional as well as world-wide.
	SEC-3 Entrepreneurial Botany		**Global** Entrepreneurial Botany guides students in their career in the fields of AYUSH, agriculture, horticulture, mushroom culture, single cell proteins etc. which are world-wide.
	SEC-4 Botany for Advanced Studies		**National** Helps students to appear for competitive tests in life-science, botany, agriculture etc. both for higher studies and employment at National level.
	For PG DSE-5 Entrepreneurial opportunities in Botany		**Global** Entrepreneurial opportunities guides students in their career in various avenues such as AYUSH, agriculture, horticulture, mushroom culture, single cell proteins, industries etc. world-wide.
	DSE-7 Organic Farming		**Regional** Organic farming is a production management system excluding of all synthetic off-farm inputs but rely upon on-farm agronomic, biological and mechanical methods such as biological fertilisers and pest control acquired from animal or plant wastes.

Suggestions and recommendations for changes in UG Botany syllabus 2023-26

Following are observations/suggestions/recommendations to be followed in each semester:

S. No.	Semester.	Name of the paper	Observations/Suggestions/recommendations
1.		CC-1 Plant Diversity I - Algae	C2 To be modified as - To provide a basis for better understanding of the plant body. C3 To be modified as - To understand the reproductive biology of algae.

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	I		C4 To be modified as - To learn mass production of algae. C5 To be modified as - To know the economic importance of algae Correspondingly the Cos were also modified. Unit I: General characters and distribution of algae have been added Unit III: *Chara* has been deleted Unit V: Title Algae as food and feed has been changed as Economic importance. Titles of relevant and available books are retained and similarly the web resources have also been reduced.
2.		SEC-I Nursery and Landscaping	Unit: I, II, III, IV & V No change
3.		Foundation Course	Newly introduced
4.	II	CC – 3 Plant Diversity II: Fungi, Bacteria, Viruses, Lichens and Plant Pathology	To be modified as: C1 – To understand the biology of viruses, mycoplasma and bacteria and their mode of classification. C2 – To study the structure and biology of fungi. C3 – To gain knowledge on the role of fungi in various fields. C4 – To understand the structure, function and ecology of lichens thereby recognize the different kinds. Comprehend the events of symbiosis and lichenization, and understand the use of lichens. C5 – To identify the main groups of plant pathogens, their symptoms and to study selected plant diseases. Contents of Unit III shifted to Unit I. Contents of Units I and II were shifted to Units II and III respectively. Contents of Unit IV were shifted to Unit V and *vice versa*. In Unit II, Type studies were reduced to just one – Zygomycotina (*Mucor*), Ascomycotina (*Peziza*), Basidiomycotina (*Puccinia*) and Deuteromycotina (*Cercospora*). In Unit IV, Geographical distrinbution of diseases has been deleted. General characters of Bacteria and Virus shifted to Unit I. Titles of relevant and available books to be retained and similarly the web resources to be reduced.
5.		SEC-II Mushroom Cultivation	Titles of relevant and available books to be retained and similarly the web resources to be reduced. Unit: I, II, III, IV & V No change
6.		SEC – III Botanical Garden and Landscaping	Titles of relevant and available books to be retained and similarly the web resources to be reduced. Unit: V

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			CAD replaced with Manures
7.	III	CC-5 Plant Diversity III Bryophytes and Pteridophytes	To be modified as Unit: I Classification of Watson, 1971 to be replaced with Rothmaler. Contents of Unit II to be shifted to Unit I and Evolution of bryophytes to be deleted. Economic importance to be shifted from Unit I to Unit II. Unit: III Contents of Unit III to be replaced with Morphology, anatomy and reproduction of reproduction of the taxa belonging to each of the following classes: Psilotopsida (*Psilotum*), Lycopsida (*Lycopodium/Selaginella*) of Unit IV. Unit: IV With the rest of the contents Unit: V Origin and evolution of pteridophytes to be deleted. Under Economic importance, ecological, medicinal, horticultural and industrial uses to be added.
8.		SEC-IV Herbal Technology	Unit: I, II, III, IV & V No change
9.		SEC-V Entrepreneurial Opportunities in Botany	No change
10.	IV	CC-7 Plant Diversity IV Gymnosperms, paleobotany and evolution	To be modified as: Unit: I Sporne's Classification up to order level. Economic importance to be shifted to Unit II. Coniferales and Cycadales to be shifted from Unit II to I. Unit: III No change Unit: IV Lepidocarpon and Calamites to be deleted. Unit: V Concept of species – Allopatric and Sympatric to be deleted.
11.		EC-4 Cultivation of Algae	No change
12.		SEC – VI Fermentation technology	No change

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13.		SEC – VII Botany for Competitive Examinations	No change
14.	V	CC – 9 Plant Morphology, Taxonomy and Economic Botany	To be modified as: Unit: 1 No change Unit: 2 History of Angiosperm classification to be modified as system of classification. An overview of APG Classification and digital herbarium to be deleted. Unit: 3 Capparidaceae to be deleted. Unit: 4 Convolvulaceae to be deleted. Solanaceae to be added. Unit: 5 Contents of the Unit 5 is modified as follows: Source, morphology of the useful parts and uses of the economically important products of the following - Cereal (Rice), Pulses (Black gram), Sugar (Sugarcane), Beverage (Coffee), Oil seed (Groundnut), spices (Cardamom) and Fibre (Cotton).
15.		CC – 11 Plant Anatomy and Embryology	To be modified as: Unit: I No change Unit: II Normal secondary growth in the dicot stem and root to be added. Nodal anatomy: leaf trace, leaf gap to be shifted from Unit II to Unit III. Branch trace and branch gap-types to be deleted. Unit: III Nodal anatomy: types (unilacunar, trilacunar and multilacunar) to be added. Secondary thickening in monocots and dicots stem, secondary thickening in monocot and dicot root, anomalous secondary growth of stem – *Nyctanthes*, periderm development and rhytidome to be deleted. Unit: IV No change Unit: V Double fertilization and triple fusion – Significance to be added. Seed structure and its importance to be deleted.
16.		CC-12 Cell Biology, Genetics and Plant Breeding	To be modified as follows: Unit: I Introduction - scope- cell organisation- Plant cell function. Cell boundaries- gross layer. Plasma

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			membrane- occurrence, chemistry, and origin. Membrane transport - Passive, active and facilitated transport to be deleted. Ultra structure of Prokaryotic cell and Eukaryotic cell to be modified as differences between Prokaryotic cell and Eukaryotic cell. Unit: II To be modified as follows: Occurrence, and origin, Golgi apparatus, Lysosomes, and Micro bodies. Semi genetic autonomy of Mitochondria and Chloroplast. Ultrastructure and functions of Polytene and Lampbrush chromosomes-, Centromere: types. cell inclusion. Unit: III Duplicate genes, ABO Blood grouping in Human. recombinations and mapping of genes on chromosomes. Sex determination in plants to be deleted. Multiple alleles – self sterility in *Nicotiana* to be added. Unit: IV Polyploidy origin, Extra nuclear inheritance and its significance - Male sterility in corn, Genetics of *Neurospora* to be deleted. Unit: V Breeding for crop improvement for paddy and sugarcane. Biotechnology in crop improvement: Transgenics – scope and limitations; Bt-Cotton to be deleted. Hybrid vigour to be added.
17.		EC-5 Entrepreneurial Botany	Unit: III Virgin coconut oil and Jasmine oil production to be deleted
18.	VI	CC-14 Plant Ecology and Phytogeography	To be renumbered as CC-14 to CC-9. To be modified as: Unit:1 Contents of Unit 3 is modified as follows: Ecosystem – definition, components – biotic-producers,consumers and decomposers. Abiotic factors. Structure and function of pond ecosystem. Ecological pyramids – types – pyramid of numbers, biomass and energy. Trophic levels- food chain – types – grazing food chain, detritous food chain and food web. Unit: 2 Contents of Unit 3 is modified as follows: Study of the following groups with special reference to morphological, anatomical and physiological adaptations: Hydrophyte – free floating, submerged and rooted- floating. Xerophytes – drought escaping, drought

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			enduring and drought resistant plants. Halophytes – salt escaping, salt resistant plants. Succession – Hydrosere. Unit: 3 Contents of Unit 3 is modified as follows: Environmental pollution – definition, pollutants – biodegradable and non-biodegradable. Source, effects and control measures of water, air, thermal and radioactive pollutions. Remedial measures – Green building. Unit: 4 Contents of Unit 4 is modified as follows: Biogeochemical cycles – faces of biochemical cycle, types – flow of energy through carbon, sulphur, phosphorous and nitrogen cycles. Unit: 5 Phytogeography continuous and discontinuous distribution, Phytogeography of India, Plant indicators. Diversification of land plants. Speciation Changing Earth. Island Biogeography. Plant Biodiversity and its importance, Consequences of deforestation and exploitation of targeted species; Forest conservation, Social forestry and Participatory Management of Forest. Concept of degeneration and regeneration of plants to be deleted.
19.	VI	CC-15 Plant Biotechnology and Molecular Biology	To be modified as follows: Unit: I Contents of Unit IV to be shifted to Unit I and add replication of DNA in eukaryotes. Unit: II Contents of Unit V to be shifted to Unit II and add transcription – post transcriptional changes, translation, DNA polymerase and S1 nucleases. Delete classes of RNA molecules. Unit: III Development of transgenic plants with reference to insect resistance to be replaced with Transgenic plants - insect resistant (BT Cotton). Unit: IV Contents of Unit I to be shifted to this Unit. Unit: V Contents of Unit II to be shifted to this Unit. Types of media and Application of plant tissue culture in agriculture, horticulture and forestry to be deleted.

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20.		CC-16 Plant Physiology and Plant Biochemistry	To be modified as: Unit: 1 No change Unit: 2 Path of carbon in photosynthesis to be deleted. Unit: 3 No change Unit: 4 Growth – plant growth regulators (auxins, gibberellins, cytokinins, ethylene and abscisic acid) - Practical applications to be modified as Growth – plant growth regulators, mode of action and practical applications of auxins, gibberellins, cytokinins, ethylene and abscisic acid. Unit: 5 No change
21.	III	MS-3 Botany for Zoology Major	To be shifted from Semester I to III and renumbered as MS-3. Unit: I Reproduction of E. Coli to be deleted. Unit: II,III&IV No change Unit: V Unit title to be changed as Genetics and Plant tissue culture
22.	IV	MS-4 Botany for Zoology Major	To be shifted from Semester II to IV and renumbered as MS-4. Unit: I Functions to be deleted. Unit: II to V No change

Suggestions and recommendations for changes in PG Botany syllabus 2023-26

Following are the observations/ suggestions/recommendations

S. No.	Semester	Name of the paper	Observations/suggestions/recommendations
1.	I	Core paper I - Plant Diversity I	In Learning objective 4, microorganisms to be deleted. Unit: I Contributions of M.O.P. Iyengar to be added. Classification by de Silva to be deleted. Classes Chrysophyceae, Cryptophyceae, Dinophyceae, Chloromoadineae and Euglenophyceae to be deleted.

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			Evolution of sex in algae to be deleted. Scytonema, Codeum and Gelidium to be deleted. Polysiphonia to be added. Unit: II Recent trends in the classification of fungi and sex hormones in fungi to be deleted. Phytophthora and Taphrina to be deleted. Unit: III Structure, reproduction and life history of *Usnea* to be added. Unit: IV Classification by Watson to be replaced by Rothmaler.Bryopsida, Anthocerotopsida and mosses to be replaced by Hepaticopsida, Anthoceropsida and Bryopsida. Funariales to be deleted. Vegetative and sexual, spore dispersal mechanisms, spore germination patterns in bryophytes to be deleted. *Lunularia* to be deleted. *Anthoceros* to be added. The Course Outcomes to be modified as follows: CO1 - Relate to the structural organizations of algae and compare the variations and life-cycle patterns in algae. CO2 - Demonstrate both the theoretical and practical knowledge in understanding the phylogeny and diversity of fungi and their importance. Co3 - Relate to the structural organizations of lichens and their uses. CO4 - Compare and contrast structural variations of gametophytes and sporophytes in bryophytes. Titles of relevant and available books to be retained and similarly the web resources to be reduced.
2.	I	Core Course II – Plant Diversity II	Learning objectives to be modified as follows: 1. To study the classification, distribution, characteristic features, structure, reproduction and life history of the major types of Pteridophytes, their phylogeny and evolution and economic importance. 2. To study the structure, anatomy, reproduction and life-history of selected pteridophytes. 3. To study the classification, distribution, characteristic features, structure, reproduction and life history of the major types of Gymnosperms and their economic importance. 4. To study the structure, anatomy, reproduction and life-history of selected Gymnosperms.

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			5. To learn the process of fossilization, characteristic features of selected fossils of Pteridophytes and Gymnosperms. Unit: I Classification by Reimer to be replaced with Sporne. Range of structure of sporophytes to be added. Telome theory and morphogenesis to be deleted. *Equisetum*, *Angiopteris*, *Osmunda* and *Azolla* to be deleted. *Psilotum*, *Selaginella* and *Marsilea* to be added. Unit: IV *Thuja* and *Ephedra* to be deleted. Course Outcomes to be modified as follows: CO1 - Recall classification, recent trends in phylogenetic relationship, general characters of Pteridophytes. CO2 - Learn the morphological/anatomical organization, life-history of major types of Pteridophytes. CO3 - Learn the morphological/anatomical organization, life-history of major types of Gymnosperms including economic importance. CO4 - Understanding the morphology and anatomy of selected Gymnosperms. CO5 - Awareness on fossil types, fossilization and fossil records of Pteridophytes and Gymnosperms. Titles of relevant and available books to be retained and similarly the web resources to be reduced.
3.	I	Core Course III – Laboratory Course I covering Plant Diversity I & II	Unit: I *Codeum* and *Gelidium* to be deleted, *Polysiphonia* to be added. To record the local algal flora–Study of their morphology and structure, identification of algae to species level (at least One), preparation of culture media and culture of green algae and blue green algae in the laboratory (Demonstration) to be deleted. Unit: II *Phytophthora* and *Taphrina* to be deleted. Isolation and identification of fungi from soil, air, and Baiting method. Preparation of culture media. Cultivation of mushroom in the laboratory (Demonstration) to be deleted. *Parmelia* to be replaced with *Usnea*. Unit: III *Lunularia* and *Polytrichum* to be deleted. *Riccia*,

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			Plagiochasma and *Pogonatum* to be added. Unit: IV *Equisetum*, *Angiopteris*, *Osmunda* and *Azolla* to be deleted, *Selaginella* and *Marsilea* to be added. Fossil *Lepidodendron* to be added. Unit: V *Thuja* and *Ephedra* to be deleted. Course Outcomes to be modified as follows: CO1 - Recall and apply the basic keys to distinguish algae at genus level based on its structural organization. CO2 - Demonstrate practical skills in describing morphological and reproductive structures of fungi and lichens. CO3 - Demonstrate practical skills in describing morphological and reproductive structures of Bryophytes. CO4 - Demonstrate practical skills in describing morphological and reproductive structures of Pteridophytes. CO5 - Demonstrate practical skills in describing morphological and reproductive structures of Gymnosperms. Titles of relevant and available books to be retained and similarly the web resources to be reduced.
4.	I	Discipline Specific Elective 1 (DSE-1) - Microbiology, Immun -ology and Plant Path -ology	Unit: I Types of micro-organisms, nutritional types, isolation and cultivation of bacteria and maintenance of bacterial culture to be deleted. Unit: II Classification and multiplication of Virus to be deleted. Animal virus to be deleted. Cultivation of viruses in embryonated egg and in plants, control of viral infections and classification of Mycoplasma to be deleted. Unit: III Food microbiology to be changed to Environmental microbiology. Beneficial role of microbes – yoghurt, Olives, Cheese, Bread, Wine, Tempeh, Miso & Fermented green tea. Spoilage of fruits, vegetables, meats, poultry, eggs, bakery products, dairy products and canned foods. Microbial toxins - Exotoxin, Endotoxin & Mycotoxin. Action of Enterotoxin, Cytotoxin& Neurotoxin. Food Preservation – temperature, drying, radiation and chemicals to be

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			deleted. Water borne diseases - diphtheria, chicken pox. Air borne diseases - Swine flu and Measles. Microbial degradation of chemical pesticides and hydrocarbon to be deleted. Water quality and waste water treatment to be added. Unit: IV Maturation, NK cells. Introduction to inflammation, Adaptive immune system, Innate Immune system to be deleted. Unit: V History and significance of Plant pathology to be deleted. Abiotic causes (Physiological, deficiency of nutrients & minerals and pollution).Mechanism of penetration-Disease development of pathogen (colonization) and dissemination of pathogens to be deleted. Red rust of tea, Cultural practices, disease controlled by immunization, Biocontrol - merits and demerits and Diagnostic technique to detect pest/pathogen infection - Immunofluorescence (IF) to be deleted.
5.	I	DSE - 2 Ethnobotany, Naturo- pathy and Traditional, Healthcare	Learning objectives to be modified as follows: 1. To be aware of the importance of the History of ethnobotany, its scope, concept and, sociological and anthropological aspects. 2. Understand the concept of ethnobotany and the life style and plants used by Indian tribals in their traditional practices. 3. Evaluate the various research techniques used to gather information on the knowledge of the tribal community. 4. To transform ethno botanical knowledge to health-care systems. 5. Use strategies to transform ethno botanical knowledge into goods with value additions. Unit: I Important landmarks in the development, a brief history of ethnobotany in the world and India to be modified as History of ethnobotany. Unit: II Plants used by Tribals of Tamil Nadu to be deleted. Unit: III Secondary data-official records, non-timber forest products (NTFP) and livelihood-sustainable harvest and value addition to be deleted. Unit: IV

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			Indian Systems of medicine (Ayurveda, Siddha, Allopathy, Homeopathy, Unani, Tibetan, Yoga and Naturopathy), Environmental Assessment, Health-care-applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well-being to be deleted. Unit: V Bioprospecting and value addition to be changed to value addition. Bioprospecting of drug molecules derived from Indian Traditional Plants: methods for bioprospecting of natural resources to be deleted. Course Outcomes to be modified accordingly.
6.	II	Core Course 4 – Cell and Molecular Biology	To be shifted from Semester III to II and Taxonomy of Angiosperms and Economic Botany to be shifted to Semester III. During Semester II, plants will not be available in flowering for Taxonomy practical classes and hence this change. Learning Objectives to be modified as follows: 1. Enable to learn various cell structures and functions of the cellular organelles of prokaryotes and eukaryotes. 2. To understand the cell division and its mechanism and anomalosity. 3. To enlighten the students with contributions of the people on molecular biology. 4. To comprehend the molecular processes. 5. A thorough study of DNA structure, replication, transcription and translation processes. Unit: I The dynamic cells, specialised plant cell types chemical foundation to be deleted. In Plasma memberane models, Fluid mosaic model to be specified. Unit: II Gene expression, Biogenesis to be deleted. Unit: III RNA editing to be shifted from Unit: II to III. Retinoblastoma and E2F proteins to be deleted. Unit: IV DNA repair to be deleted since it is a repetition. Transcription, enzymes involved, post transcription changes to be deleted since the same are found in Unit: III. Unit: V cDNA and genomic library to be shifted to Unit: IV Course Outcomes to be modified accordingly.

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7.	II	Core Course 5 – Plant Anatomy and Embryology of angiosperms	Learning Objectives to be modified as follows: 1. Classify meristems and identify their structures, functions and roles in monocot and dicot plants growth and secondary growth of woody plants. 2. Learn the importance secondary growth and anomalies; nodal anatomy. 3. Understand the structure and development of male gametophyte. 4. Understand the structure and development of female gametophyte. 5. Understand the cause and importance of polyembryony, apomixes and parthenocarpy. Unit: I Title Cell Wall to be changed to Tissue Systems. Morphological and 14 hosph-chemical changes; Plasmodesmata – types of pits – growth of cell wall – formation of intercellular spaces and Evolution of tracheary elements to be deleted. Unit: II The title Periderm to be changed to Secondary Growth. Structure, organization and activity of phellogen. Polyderm and Rhytiderm – wound periderm. Major nodal types; Kranz anatomy and its significance. Microtechnique: Principle of killing and fixation, dehydration and rehydration of botanical specimens. Stains: Principle of double staining (fast-green and light green) of free hand sections; Protocol for serial sectioning of paraffin wax impregnated specimens; Mounting and mounting media, Amaranthaceae and Piperaceae to be deleted. Primary thickening in Palms to be changed as secondary thickening in Palms. Unit: III Pollen physiology to be deleted. Unit: IV Aril and preferential fertilization to be added. Course Outcomes to be modified accordingly.
8.	II	Core paper 8 – Ecology, Phytogeography, Conservation Biology & Intellectual Property Rights	Learning Objectives to be modified as follows: 1. To comprehend the fundamental ideas of plant ecology scientifically and to analyse the various components present. 2. To Understand the concept of ecosystem and the various components. 3. To study the distribution of plants and its significance.

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			4. To study biodiversity management and conservation. 5. To enhance the knowledge of the students and equip them in evaluating and protecting invaluable components of nature. Unit: I Introduction – History, scope, concepts. Diversity of plant life; growth form, life form to be deleted. Unit: II Environment Deterioration: Climate change – Greenhouse effect and global warming, ozone depletion and acid rain. Waste management – Solid and e-waste, recycling of wastes. Eco-restoration/remediation ecological foot prints – carbon foot print – ecolabelling – environmental auditing to be deleted. Unit: IV Endangered and endemic plant species of India to be deleted. Unit: V IPR in India genesis and development. Patent filing procedure for ordinary application to be deleted. Course Outcomes to be modified accordingly.
9.	II	Discipline Specific Elective DSE-3 – Research Methodology	Learning Objectives to be modified as follows: 1. To equip students to collect, analyze and evaluate data generated by them in a scientific manner. 2. To gain knowledge on the working of various instruments and their applications. 3. To have an insight on the working and use of computers in botany and to apply the knowledge in creating biological databases. 4. To be aware of the most recent biological databases and avail them using search engines. 5. Knowledge to operate various software resources. Unit: I Bibliometrics (scientometrics): definition-laws – citations and bibliography – biblioscape to be deleted. Unit: II Lyophilizer and Polymerised Chain Reaction (PCR) to be deleted. Transmission Electron Microscope (TEM) to be added. Unit: III Finding Scientific Articles to be deleted. In using search engines Google and Pubmed to be specified Unit: IV NCBI, EMBL, DDBJ, SWISSPORT shifted from

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			Unit: V. PUBCHEM to be added. Course Outcomes to be modified accordingly.
10.	II	DSE - 4 Biostatistics	Learning Objectives to be modified as follows: 1. To provide the student with a conceptual overview of statistical methods. 2. To emphasize on the application of variables and the measures of dispersion. 3. To understand the basics of probability and its distribution. 4. To gain knowledge on testing hypothesis. 5. To understand correlation and regression to test the level of significance. Course Outcomes to be modified accordingly. DSE – 4 to be renumbered as DSE – 6 since it is to be shifted from Semester II to Semester III. New paper – No change
11.	III	CC-7 Taxonomy of Angiosperms & Economic Botany	Taxonomy of Angiosperms & Economic Botany to be re-numbered from Core 4 to Core 7 Unit: I Botanical explorations to be deleted; Takhtajan to be replaced with A.P.G. IV. Botanical gardens and herbaria of world to be replaced with Role of Botanical Gardens and Botanical Survey of India Unit: II Biosystematics to be replaced with Molecular Taxonomy; ICBN changed to ICN; uninominal systems to be deleted; Important articles to be deleted; recommendations and amendents of code. Glossories and dictionaries to be deleted instead rejection, choice and retention of names; floras, monographs and revisions to be added. Unit: III Dicotyledonous families as title to be added. Turneraceae to be replaced with Capparidaceae. Gamopetalae to be shifted from Unit IV to III. Unit: V (xii) Plants used as avenue trees for shade, pollution control and aesthetics to be deleted
12.	III	DSE-8 Genetics, Evolution and Plant Breeding	The title of the paper to be changed as Genetics, Evolution and Plant Breeding, and Biostatistics to be deleted as there is a separate Elective paper as Biostatistics. Unit: I Under modified dihybrid ratios, complementary genes and epistasis to be specified. Similarly, under Quantitative inheritance, Ear size in corn to be

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			specified. Multiple allele inheritance to be added with Self sterility in *Nicotiana*; Linkage and Crossing-over, Extra-chromosomal inheritance (maternal inheritance) to be added. Sex determination in plants and theories of sex determination, Sex linked characters to be deleted. Inducible operon, Producer gene, structural gene and integrator gene; Britten and Davidson model to be deleted. Regulator super repressor, super repressor, inducer to be deleted. Structure of Gene, Operon, Operator, regulator, Promoter, repressor, Polycistronic m RNA; Gene function and regulation in prokaryotes with reference to Lac operon and trp operon. Gene Regulation eukaryotes – *Arabidopsis* to be shifted to Unit II. Unit: II Recombination: Homologous and non-homologous recombination, site-specific recombination. Holiday model of recombination to be deleted. Transposable elements in prokaryotes to be deleted. UV induced mutation and its repair mechanism. Mismatch DNA repair mechanism. Mutation types-frame shift mutation, addition, deletion, substitution, transition and transversion. Xeroderma pigmentosum to be shifted to Unit III. Unit: III Chromosomal aberration - types to be added. Extra chromosomal inheritance, maternal inheritance to be shifted to Unit I. ABO blood group in humans. QTL mapping, Gene mapping methods: Linkage maps, tetrad analysis, mapping with molecular markers ,mapping by using somatic cell hybrids. Organelle genomes : Organization and functions of chloroplast and mitochondrial DNA to be deleted. Unit: IV Plant Breeding to be shifted to Unit V. Instead Evolution to be added in Unit IV. Unit: V Plant Breeding - no change
13.	III	DSE-6 Biotechnology	The title Recombinant DNA Technology and Industrial Applications to be changed to Biotechnology.

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			Unit: I Recombinant DNA technology – Enzymes and vectors to be specified. Direct gene transfer – electroporation, liposome mediated to be specified. Indirect gene transfer – agrobacterium mediated. Blotting techniques – Southern and Western to be added. Transformation, production of gene products from cloned genes to be deleted. Vitamins, antibiotics and Anticancer drugs, interferons, etc., are produced using this technology to be deleted. Unit: II Contents of this unit to be shifted to Unit IV. Mechanism of recombination – role of recA and recBCD enzymes, chi-sequences, site-specific recombination, genetic markers – RAPD, ISSR, AFLP, SCAR and SAT-DNA, PCR and cloning techniques to be added to this unit. Unit: III BT-Cotton and Golden rice to be shifted from Unit V to this unit. BT-brinjal to be deleted. Transgenic plants – herbicide resistant plants (Glyphosate). Strategies for development of Flavour Savr tomato. Terminated gene technology and molecular farming for production of pharmaceutical products to be added. Human Deoxyribonuclease I, Human Tissue Plasminogen Activator, β-Glucocerebrosidase, L-Asparaginase, Deoxycytidine kinase, Acid sphingomyelinase to be deleted. Production of antibiotic medicines: Penicillins, aminoglycosides to be shifted to Unit IV. Unit: IV Erythropoietin used in the treatment of anemia. Interferons Interferon-alfa- hairy cell leukemia. Interferon-Beta-1b is used to treat relapsing multiple sclerosis, malignant glioma, and melanoma to be deleted. Unit: V Gene sequencing methods – Maxum & Gilbert, Sanger's Chain Termination method and automated sequencing. Genome – mitochondrial and chloroplast. Regulating rDNA technology – patenting, IPR, bio-ethics and safety to be added. rDNA technology uses in animal husbandry and sericulture. milk production in cattle, cheese ripening, and reduction of lactose levels. Fungal α-amylase silk production in sericulture. Uses in agriculture. rDNA

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			technology can produce high yielding plants with the desired quality to be deleted.
14.	III	DSE - 5 Entrepreneurial Opportunities in Botany	New paper – no change
15.	IV	CC- 10 Plant Physiology & Plant Metabolism	CC-12 to be renumbered as CC-10. Unit: I Physical and chemical properties of water and partitioning of assimilates and harvest index to be deleted. Guttation to be added. Unit: II The physical nature of light – the absorption and fate of light energy, Ultrastructure and biochemical compartmentation of Chloroplast to be deleted. Biochemistry and Molecular Biology of RUBISCO to be modified as brief account on enzyme RUBISCO. Unit: III An overview of plant to be deleted. Respiratory Quotient (RQ) and AO respiration to be added. Respiration and its significance in crop improvement to be deleted. Unit: IV Growth substances to be changed as growth hormones – physiological role, mode of action and applications. Physiological effect and mechanism of action in agricultural and horticultural crops to be deleted. Biological rhythms and movements, Seed germination and their biochemical changes to be deleted. Methods to break dormancy to be added. Unit: V Contents of Unit V to be modified as follows: Stress physiology- abiotic and biotic – adaptive mechanism to various stresses (avoidance, escape, tolerance). Effects and mechanism to various stresses on plants – drought, cold, high temperature, UV- radiation. Role of proline and molecular chaperones in stress. Senescence and aging – types and mechanism of senescence - Abscission: Morphological and biochemical changes – Significance. Fruit ripening- Biochemical, Physiological changes and control of fruit ripening to be deleted.
16.	IV	CC-11 Biochemistry & Biophysics	The title of CC-13 to be modified as Biochemistry & Biophysics and renumbered as CC-11. Unit: I Henderson-Hasselbalch equation to be added.

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			Classification of carbohydrates – structure and properties of monosaccharides, oligosaccharides, polysaccharides – glycoproteins to be shifted from Unit II to Unit I. From Thermodynamics principles up to binding energy to be shifted to Unit V. Unit: II Photosynthesis: The physical nature of light – the absorption and fate of light energy – absorption and action spectra - photoreceptors - Ultra structure and biochemical compartmentation of Chloroplast; Biomolecules and Enzymes to be deleted. Unit: III Lineweaver Burk plot, mechanism of enzyme action to be deleted. Secondary Metabolites: Structure, classification and properties of alkaloids, steroids, terpenoids, flavonoids, Glycosides to be shifted to Unit IV - their chemical nature and role to be deleted. Vitamins – classification and properties to be added. Unit: IV Contents of this Unit to be replaced with the following: Secondary Metabolites: Structure, classification and properties of alkaloids, steroids, terpenoids, flavonoids, Glycosides. Synthesis through mevalonic acid and Shikimic-acid path way. Unit: V Free energy and equilibrium constant, calculation of equilibrium constant and free energy, high energy compounds, redox reactions, oxidation potential and coupling of chemical reactions. Electromagnetic spectrum, UV-irradiation – application. Action and absorption spectrum – fluorescence, phosphorescence and bioluminescence to be added.
17.	IV	DSE-7 Organic Farming	DSE-6 to be renumbered as DSE-7 Unit: I The contents of this unit to be modified as follows: Organic farming – principles, characteristics, types, significance, scope of organic farming in India. Organic farming methods – for cereals, vegetables and fruit crops. Initiatives by Government/Non-governmental Organisations (NGOs) for promoting organic farming. Operational structure of NPOP (National Programme for Organic Production). Unit: II Organic farming practices for improving soil health to be deleted.

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			Unit: III Indigenous technical knowledge for insects-pest, disease - Weed and nutrient management in organic farming to be deleted. Unit: IV & V No change

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Members present

1. Dr. A.E. Dulip Daniels (Head) - Chairperson
2. Dr. M. Reginald
3. Dr. J. Lohidas
4. Dr. J. Irene Wilsy
5. Dr. B. Christudhas Williams
6. Dr. S. Thambi Raj
7. Dr. S. Jeeva
8. Dr. C.P. Ben
9. Dr. V.P. Shamal
10. Dr. Avvai M.S. Vijaya
11. Dr. Lini, J.J.
12. Dr. T.S. Shynin Brintha
13. Dr. V. Manimekalai (VC Nominee) 9.12.2023
14. Dr. M. Johnson (Subject Expert) 09/12/23
15. Dr. A. Saravana Ganthi (Subject Expert) 9/12/23
16. Dr. A. Anami Augustus Arul (Illustrious Alumnus)
17. Mr. M. Ashok Macrin (Industrialist)

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