



Dharmabad Shikshan Sanstha's
Lal Bahadur Shastri Mahavidyalaya, Dharmabad. 431809
ACADEMIC YEAR 2022-23

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. D.R. More and Mr. Y.L. Khandhare

Department: Botany

Program: B.SC /FY

Subject: Botany

Course Code: CCB-I SEC-A

Paper Title: Viruses, Bacteria Algae , Fungi , Lichens and Mycorrhiza

Paper Number: I

Unit Number	Unit Name	Topics	Unit-wise Outcome
I	Microbes	Viruses –Introduction, general characters of viruses, replication (general account), and RNA virus (TMV); Economic importance; study of yellow vein mosaic of Bhendi Bacteria – Introduction, General characters and cell structure; Reproduction – vegetative, asexual (Binary Fission) and recombination (conjugation,) Study of Citrus Canker and Economic importance of Bacteria.	Differentiate between various classes of viruses and Bacteria
II	Algae	Introduction, General characters, Ecology and distribution; Range of thallus organization and reproduction; Classification of algae (F. E. Fritch's 1935); Morphology and life-cycles of the following: <i>Nostoc</i> , <i>Oedogonium</i> and <i>Ectocarpus</i> . Economic importance of algae	Learn life cycle of the genera mentioned in the syllabus

III	Fungi	Introduction- General Characteristics, ecology and significance, cell wall composition, nutrition, reproduction and classification (Alexopolous & Mims 1979); General characteristics, ecology, significance and life cycle of, <i>Penicillium</i> , <i>Alternaria</i> (Deuteromycota), <i>Agaricus</i> (Basidiomycota).	Differentiate between life cycle of the genera
IV	Lichens and Mycorrhiza	Lichens: General characters, types and economic importance. Mycorrhiza: General characters, ectomycorrhiza and endomycorrhiza and their significance	Can learn about the life cycles of individual Lichen and Mycorrhiza

Specify Course Outcome: Student will learn about individual genera belonging to Bacteria, viruses, Fungi, Algae, Lichen and mycorrhiza

Specify Program Outcome: Student will get knowledge about conservation of different life forms

Signature of Teacher

Dharmabad Shikshan Sanstha's
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Academic Year 2022-23

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. Prasannarani Tanneru

Department: Botany

Program: B.SC /FY

Subject: Botany

Course Code: **CCB-I SEC-B**

Paper Title: Plant Ecology, Phytogeography and Environmental Biology

Paper Number -II

Unit Number	Unit Name	Topics	Unit-wise Outcome
I	Ecological Factors	Introduction, Scope of Ecology, Ecological Factors: Climatic factors- Light, Temperature, Wind, Humidity. Edaphic factors- Soil moisture, Temperature, Soil pH, Soil formation, Composition and Soil profile.	Student will know scope of ecology, and factors of environment
II	Ecological Adaptations	Morphological and anatomical adaptations in Hydrophytes (<i>Hydrilla</i> stem and <i>Nymphaea</i> petiole), Xerophytes (<i>Nerium</i> leaf and <i>Casuarina</i> stem). General characters of Halophytes and Epiphytes	Study morphological and anatomical adaptations of xerophytes, hydrophytes
III	Ecosystem and Plant Communities	Ecosystem: Introduction, Structure, types (Pond ecosystem and Forest ecosystem), Tropic levels, Energy flow in ecosystem, food chain, food web and ecological pyramids. Community ecology: Community characteristics, Frequency, Density, Life forms and ecological succession (Hydrosere), Analysis of Plant communities (quadrant method).	Student will learn structure and types of ecosystem, energy flow food chain, food web, ecological pyramids in ecosystem

IV	Phytogeography and Environmental Biology	Introduction, Bio-geographical regions of India, Bio-diversity hot spots of India Environmental pollution: Air, Water and soil pollution (Causes, effects and control measures), Soil erosion and soil conservation, afforestation , deforestation and Chipko movement, Environmental education and awareness.	Study of biogeography and biodiversity of India
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Specify Course Outcome: student will be able to understand scope of ecology and their ecological factors, adaptations and phytogeography and environmental biology

Specify Program Outcome: Knowledge about Environmental factors will motivate students to conserve environment.

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Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. Prasannarani Tanneru

Department: Botany

Program: B.SC /FY

Subject: Botany

Course Code: CCB-II SEC-A

Paper Title: Bryophytes, Pteridophytes, Gymnosperms & Paleobotany

Paper Number-III

Unit Number	Unit Name	Topics	Unit-wise Outcome
I	Bryophytes	General characters, Classification (N.S.Parihar), morphology, anatomy and reproduction of <i>Marchantia</i> and <i>Funaria</i> . (Developmental study not expected), Economic importance of bryophytes.	Student will learn the life cycles of individual genera of bryophytes
II	Pteridophytes	General characters, classification (N.S.Parihar), morphology, anatomy and reproduction of <i>Lycopodium</i> and <i>Marsilea</i> . (Developmental study not expected), Homospory, Heterospory and seed habit, stelar evolution, economical importance of Pteridophytes.	Student will learn life cycles of individual genera of Pteridophytes
III	Gymnosperms	General characters, classification (K.R.Sporne, 1964), morphology, anatomy and Reproduction of <i>Cycas</i> and <i>Pinus</i> . (Developmental study not expected), Ecological and Economic	Student will learn life cycles of individual genera of Gymnosperms
IV	Paleobotany	Introduction to palaeobotany, process of plant fossilization, types of fossils, geological time scale, Study of fossil Gymnosperms- <i>Lyginopteris oldhamia</i> (stem), <i>Bennettites</i> (flower) and General characters of <i>Ginkgo</i> (A living fossil).	Student learn about process of fossil formation and fossil plants

Specify Course Outcome: learn the life cycles of individual Bryophytes, Pteridophytes, Gymnosperms and Palaeobotany

Specify Program Outcome: students will understand classification, morphology, anatomy and reproduction and learn about process of fossil formation and fossil examples

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Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. D. R. More

Department: Botany

Program: B.SC /FY

Subject: Botany

Course Code: CCB-II SEC-B

Paper Title: Taxonomy of Angiosperms

Paper Number-IV

Unit Number	Unit Name	Topics	Unit-wise Outcome
I	Introduction	Aims of Taxonomy, Principles of Taxonomy, Identification, Nomenclature and Classification, Principles and rules of ICN (Rank of taxa, typification, author citation) Importance of Herbarium, important herbaria and botanical gardens of the India.	Understanding classification and nomenclature of plants
II	Plant Classification	Taxonomic hierarchy, Types of classification-artificial, natural and phylogenetic. Bentham and Hooker, Engler and Prantl (up to family level with reference to families mentioned in the syllabus).	Plant Classification types typically Bentham and Hooker's

III	Morphology of Angiosperms	<p>Root: Definition, characters, types (tap root and adventitious) and functions. Stem: Definition, characters and functions. Leaf: Definition, structure of typical leaf (Hibiscus), functions, types- Simple (Hibiscus), Compound (unipinnate, bipinnate, tripinnate, unifoliate, bifoliate, trifoliate, multifoliate), venation- definition, types (reticulate, parallel), Phyllotaxy. Inflorescence: Definition, types- Racemose (characters), Cymose (characters). Flower: Definition, symmetry, actinomorphic, zygomorphic, types (hypogynous, epigynous, perigynous), structure of typical flower (Hibiscus), calyx (polysepalous, gamosepalous), corolla (polypetalous, gamopetalous), Androecium (parts of a stamen), Gynoecium –structure of carpel, apocarpous, syncarpous, placentation (axile, parietal, free central, marginal, basal) Fruit: Definition, forms- simple (dry, legume, fleshy, berry), aggregate (Etario of berries), composite (Sorosis).</p>	Student will learn about morphological characters of different parts of plant in detail
IV	Study of Plant families	Study of vegetative and floral characters of following families: Brassicaceae, Fabaceae, Solanaceae, Lamiaceae and Poaceae .	Student will get knowledge about different families

Specify Course Outcome: Development of knowledge about of different angiosperm families, taxonomic tools and the origin of angiosperm

Specify Program Outcome: awareness of plant biodiversity at local college level, universities and Educational institutes

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Academic Year 2022-23

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. D. R. More

Department: Botany

Program: B.SC /SY

Subject: Botany

Course Code: CCB-III SEC-A

Paper Title: Morphology and Taxonomy of Angiosperms

Paper Number-VI

Unit number	Unit Name	Topics	Unit-wise outcome
I	Morphology of Angiosperms	Root: definition, characters, types (tap and adventitious) and functions. Stem: definition, characters, modifications (stem tendril, phylloclade, tuber, rhizome, corm and runner) and functions. Leaf: definition, structure of typical leaf (Hibiscus), functions, types-simple (hibiscus), compound (unipinnate, bipinnate, tripinnate, unifoliate, bifoliate, trifoliate, multifoliate), venation-definition, types (reticulate, parallel), phyllotaxy, inflorescence: Definition, types -Racemose (Characters), cymose (characters), Flower: Definition, symmetry, actinomorphic, Zygomorphic, types (hypogynous, epigynous, perigynous), structure of typical flower (hibiscus), Calyx (polysepalous, gamosepalous), corolla (Polypetalous, gamopetalous), androecium (parts of stamen), gynoecium- Structure of carpel, apocarpous, syncarpous, placentation (axile, parietal, free central, marginal, basal) Fruit: Definition, types (true, false), forms-simple (dry, legume, fleshy, berry), aggregate (taerio of berries), composite (sorus)	Awareness of basic terminologies of plant morphology

II	Taxonomy of Angiosperms	Introduction, scope and objectives of angiosperm taxonomy, binomial nomenclature, taxonomic ranks, types of classification (artificial, natural and phylogenetic), salient features of Bentham and Hooker and Engler and Prantl's system of Classification with merits and demerits	Examination of causes of classification of plants
III	Study of Families-I	Distribution, vegetative morphology (habitat, habit, root, stem, leaf), Reproductive morphology (inflorescence, general description of flower, calyx, corolla, androecium, gynoecium, pollination, fruit) floral formula, floral diagram, systematic position (as per Bentham and Hooker's system), distinguishing characters and economic importance of plants (at least two) of the families-Annonaceae, Brassicaceae, Malvaceae, Mellaceae, Caesalpinaceae, Fabaceae, Apiaceae.	Students will be able to identify the major families of plants with economic importance
IV	Study of Families-II	Distribution, Vegetative morphology (habitat, root, stem, leaf), Reproductive morphology (inflorescence, general description of flower, calls, corolla, androecium, gynoecium, pollination, fruit), floral formula, floral diagram, systematic position (asper Bentham & Hooker's system), Distinguishing characters and economic importance of plants (at least two) of the families _ASteracear, Solanaceae, Euphorbiaceae, Lamiaceae, Liliaceae and Poaceae	Students will identify the major families of plants and their economic importance

Specify Course Outcome: knowledge of examination, classification, families of plants , economic importance of plants

Specify Program Outcome: ability of identification, classification of plants in nature along with their economic importance is the main outcome

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Academic Year 2022-23

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. Prasannarani Tanneru

Department: Botany

Program: B.SC /SY

Subject: Botany

Course Code: CCB-III SEC-B

Paper Title: Histology, Anatomy and Embryology of Angiosperms

Paper Number-VII

Unit number	Unit Name	Topics	Unit-wise outcome
I	Histology	Meristematic tissues: definition, classification based on position and origin, Histological organisation of root and shoot apices, Apical cell theory, Histogen theory and Tunica corpus theory. Simple Tissues: Parenchyma, Collenchyma, Sclerenchyma Complex tissues: xylem and Phloem Secretory tissues: Laticiferous tissues (latex cells and vessels), Glandular tissues (External glands- digestive glands, nectary glands and internal glands-Oil glands, hydathodes)	Student will learn histology and various tissues
II	Anatomy	Vascular bundles: Definition and types Primary Structures: Root anatomy of Monocotyledons (Maize and Dicotyledons (sunflower), Stem anatomy of Monocotyledons (maize and Dicotyledons (sunflower), Anomalous secondary growth in Achyranthes stem and Dracaena stem. A	Knowledge about description of Anatomy of Dicot and Monocots

III	Embryology-I	Introduction: Definition and Scope, Microsporangium-Structure (T.S of typical anther), Microsporogenesis, Structure of Pollen grain, Pollination (self and Cross pollination in Brief), Development of male gametophyte, Megasporangium-structure (L.S. of typical ovule), Types of ovule	Student learn embryology and micro sporogenesis and megasporogenesis
IV	Embryology-II	Megaspores, Development of Monosporic (Polygonum type), Bisporic (Allium type) and Tetrasporic (Adoxa type) female gametophytes, Fertilisation- Double fertilisation and significance, Endosperm- Definition and types (Nuclear, Cellular and Helobial endosperm), Embryo-Definition, Development of Monocot and Dicot (Crucifer type)embryo, Development of Seed and Fruit (Post fertilisation changes)	Student learn embryology and micro sporogenesis and megasporogenesis, fruit formation and seed formation

Specify Course Outcome: knowledge about histology, Anatomy embryology and various tissues

Specify Program Outcome: Students will get motivated about Histology, Anatomy and Embryology of angiosperms

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Academic Year 2022-23

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. D. R. More and Dr. Y.L. Khandhare

Department: Botany

Program: B.SC /SY

Subject: Botany

Course Code: CCB-IV SEC-A

Paper Title: Gymnosperms and Palaeobotany

Paper Number-VIII

Unit number	Unit name	Topics	Unit-wise outcome
I	Gymnosperms	Introduction, general characters and classification of Gymnosperms (as per D.D. Pant, 1957), Morphology of vegetative structures, anatomy of stem (primary and secondary growth) and anatomy of leaf, reproductive structures and life cycle (Developmental stages are not expected) and economic importance of Cycas.	Learn the life cycles of individuals belonging to gymnosperms
II	Pinus	Morphology of vegetative structures, anatomy of stem (primary and secondary growth) and anatomy of leaf, reproductive structures and life cycle (Developmental stages are not expected) and economic importance of Pinus.	Learn about process of fossil formation and fossils plants
III	Gnetum	Morphology of vegetative structures, anatomy of stem (primary and secondary growth) and anatomy of leaf, reproductive structures and life cycle (developmental stages are not expected), affinities and relationship with angiosperms and economic importance of Gnetum	Learn about the characters, structure and reproduction

IV Academic Year 2022-23	Palaeobotany	Introduction to Paleobotany, process of plant fossilisation, types of fossils, geological time scale, study of fossil Gymnosperms- yginopteris oldhamia (stem), Bennettites (flower) and General characters of Ginkgo (A living fossil).	Student will learn about the characters of taxa belonging to fossil
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Specify Course Outcome: Learn about Gymnosperms and Paleobotany concepts, classification identification anatomy and description

Specify Program Outcome: Motivation of the students towards cultivation, conservation and observation of different plants especially gymnosperms

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Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. Prasannarani Tanneru

Department: Botany

Program: B.SC /SY

Subject: Botany

Course Code: CCB-IV SEC-B

Paper Title: Ecology and Environmental Biology

Paper Number-IX

Unit Number	Unit Name	Topics	Unit-wise outcome
I	Ecological Factors	Introduction-Definition of ecology and environment, divisions, fields and scope of ecology, environmental or ecological factors-climatic factors (Atmosphere, atmospheric humidity, light and temperature), edaphic factor (soil components, soil formation and soil profile)	Able to understand the ecological principles
II	Ecological adaptation in plants	Morphological, anatomical and physiological responses of plants to water, morphological and anatomical adaptation in Hydrophytes (Hydrilla stem and Nymphaea petiole), Xerophytes (Casuarina stem and Nerium leaf), Halophytes (General characters)	Students will learn about different types of adaptations in nature
III	Community ecology	Community ecology-community characteristics, frequency, density, life forms and ecological succession (Hydrosere), analysis of plant community (Quadrant method), Ecosystem-Introduction and structure (Abiotic and biotic components) of ecosystem., Pond and grassland ecosystems, Energy flow in an ecosystem, Food chain and food web, ecological pyramids	Knowledge about interactions taking place in the ecosystems and flow of energy

IV	Environmental biology	Biogeochemical cycles- Water and Nitrogen cycle, pollution-causes effect and control measures of water, sol and air pollution, soil erosion-types, methods of soil conservation, Bio-geographical regions of India, Afforestation, Deforestation, and chipko movement.	Knowledge about the concept pollution, awareness about environment and its conservation
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Specify Course Outcome: Scope of ecology and there ecological factors, adaptations, environmental pollution and community ecology

Specify Program Outcome: Environmental factors and their knowledge motivates students of various institutes, universities for conservation of plants.

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Academic Year 2022-23

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. Prasannarani Tanneru

Department: Botany

Program: B.SC /TY,

Subject: Botany

Course Code: DSEB-I SEC-A

Paper Title: Plant Physiology

Paper no : XII

Unit Number	Unit Name	Topics	Unit-wise Outcome
I	Plant water relations	Importance of water in plant life Different bio-physico-chemical phenomenon: Permeability, Diffusion, Osmosis, Plasmolysis and Imbibition. Ascent of sap: Introduction and mechanism (transpiration pull theory), Transpiration: Definition, types, structure of stomata, mechanism of opening and closing of stomata (starch-sugar theory and K ⁺ pump theory). Plant movements: Introduction, classification, paratonic and	Students will understand importance of water in plant life
II	Mineral nutrition	Major and Minor elements: Introduction, source, deficiency symptoms and their role. Mineral salt absorption: Introduction, mechanism of passive absorption (ion exchange theory) and active absorption (carrier concept theory) Translocation of organic solutes: Introduction, mechanism of translocation (Munch-Mass flow hypothesis)	Various types of minerals can be understood necessary for plants

III	Growth and development	<p>Growth and Plant growth regulators: Introduction, phases of growth, measurement of growth (arc indicator and Pfeiffer's auxanometer), factors affecting growth, Chemical nature and practical applications of Auxins, gibberellins, cytokinins, abscisic acid and ethylene.</p> <p>Seed dormancy: Introduction, causes of seed dormancy and methods of breaking seed dormancy</p> <p>Seed germination: Introduction, types and mechanism of seed germination,</p> <p>Physiology of flowering: Introduction, Photoperiodism (LDP, SDP and DNP),</p> <p>Vernalization and devernialization: Introduction, mechanism and significance,</p>	<p>Knowledge about growth, development, plant growth hormones</p> <p>Knowledge about flower production</p>
IV	Biomolecules and secondary metabolites	<p>Biomolecules:</p> <p>Carbohydrates: introduction, structure and classification, Monosaccharides, disaccharides and polysaccharides (starch and cellulose)</p> <p>Protein- Introduction, classification and biological functions of Primary, secondary (α helix and β sheets), tertiary and quaternary structure</p> <p>Lipids: Introduction, structure classification and biological functions of lipids</p> <p>Secondary metabolites: Biological functions of tannins, terpenoids, flavonoids, alkaloids, essential oils and organic acids</p>	<p>Learning biomolecules and secondary metabolites</p>

Specify Course Outcome: Understand importance of water, mineral nutrition, biomolecules secondary metabolites

Specify Program Outcome: Knowledge about biomolecules and secondary metabolites and awareness about plant physiological processes

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Academic Year 2022-23

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. D.R. More and Dr. Y. L. Khandhare

Department: Botany

Program: B.SC /TY

Subject: Botany

Course Code: DSEB-I SEC-B

Paper Title: Systematic Botany-I

Paper number: XIII

Unit Number	Unit Name	Topics	Unit-wise Outcome
I	Classification	Introduction- Definition, aims, scope and application of angiosperms taxonomy, Types of classification- Artificial, Natural and Phylogenetic, Outline of Bentham and Hooker, Engler and Prantl and Hutchinson's systems of classification of angiosperms with merits and demerits	Learn about different types of classification of plants
II	Principles of taxonomy	ICN (International Code of Nomenclature)- Brief history, principle of priority, effective and valid publication, typification and author citation, Species concept- Morphological and biological, Role of phytochemistry, cytology, anatomy and palynology in relation to taxonomy. Pollen morphology with reference to pollen grains of Hibiscus, Ipomoea and Grasses	Proficiency with the basic terminologies, principles of plant taxonomy
III	Study of Dicot families-I	Study of following families according to Bentham and Hooker's system of classification with reference to general characters, pollination, floral formulae, floral diagrams, systematic position, distinguishing features and economic importance Papaveraceae, Mimosaceae, Combretaceae, Myrtaceae, Rutaceae, Cucurbitaceae	Students will identify the major families of plants and their economic importance

IV	Study of Dicot families-II	Study of following families according to Bentham and Hooker's system of classification with reference to general characters, pollination, floral formulae, floral diagrams, systematic position, distinguishing features and economic importanceRubiaceae, Apocynaceae, Convolvulaceae, Bignoniaceae,	Able to identify the major families of plant and their economic importance
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Specify Course Outcome: Develop knowledge regarding classification, principles of taxonomy and different dicot and monocot families

Specify Program Outcome: Create the awareness of systematic botany and its identification , description and classification of plants among the students.

Signature of Teacher

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. Prasannarani Tanneru

Department: Botany

Program: B.SC /TY,

Subject: Botany

Course Code: DSEB-II SEC-A

Paper Title: Plant Metabolism, Biochemistry and Biotechnology

Paper no : XIV

Unit Number	Unit Name	Topics	Unit-wise Outcome
I	Photosynthesis and respiration	Photosynthesis: Introduction, significance, ultra structure of chloroplast, photosynthetic pigments, concepts of two Photo systems, Mechanism of photosynthesis, Light reaction, Hill reaction, Cyclic and Non cyclic photophosphorylation, Dark phase, Calvin cycle (C3) and Hatch and Slack (C4) pathway, CAM pathway Respiration: Introduction, significance, ultra structure of mitochondria, structure and functions of ATP, Types of respiration: Aerobic respiration- Glycolysis, Krebs's cycle, Electron Transport System. Anaerobic respiration- Fermentation	Proficiency in basic terminologies of photosynthesis and respiration
II	Enzymes and Nitrogen metabolism	Enzymes: Introduction, nomenclature and classification (IUB), mechanism of enzyme action (lock and key model, induced fit model), Concept of holoenzyme, mechanism of regulation of enzyme activity-Feedback and allosteric regulation. Nitrogen metabolism: Introduction, sources and forms of nitrogen, types of nitrogen fixation- physical and biological (symbiotic and asymbiotic), Ammonification, nitrification and	Students will learn about enzymes, mechanism of enzyme action with regulations Basic knowledge about Nitrogen metabolism

III	Biotechnology	<p>Tissue culture: Introduction and basic aspects of tissue culture, media, culture techniques, cellular totipotency.</p> <p>Applications of tissue culture: Micropropagation, Production of disease free plants, production of secondary metabolites, Anther culture and production of haploids, protoplast culture and somatic hybridization, synthetic seeds</p>	Student will learn about tissue culture and different application
IV	Genetic engineering	<p>Introduction, tools and techniques of recombinant DNA technology, Cloning vectors, Gene cloning, Genomic library and cDNA library, <i>Agrobacterium</i> mediated gene transfer, transgenic plants. Bioinformatics: Introduction, Biological database, NCBI, BLAST.</p>	Knowledge about Genetic Engineering and Bioinformatics

Specify Course Outcome: Students will learn about different types of enzymes, Biotechnology metabolism and Genetic engineering

Specify Program Outcome: Understanding this course will led students to study further recent techniques and tissue culture concepts along with statistics used in Botany

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Academic Year 2022-23

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr. D.R. More and Dr. Y.L. Khandhare

Department: Botany

Program: B.SC /TY,

Subject: Botany

Course Code: DSEB-II SEC-B

Paper title: SYSTEMATIC BOTANY-II

Paper Number: XV

Unit number	Unit name	Topics	Unit-wise outcome
I	Study of monocot families-I	Study of following families according to Bentham and Hooker's system of classification with reference to general characters, pollination, floral formulae, floral diagrams, systematic position, distinguishing features and economic importance Musaceae, Zingiberaceae, Cannaceae Amaryllidaceae	Able to identify the major families of plants and their economic importance
II	Study of monocot families-II	Study of following families according to Bentham and Hooker's system of classification with reference to general characters, pollination, floral formulae, floral diagrams, systematic position, distinguishing features and economic importance, Orchidaceae, Commelinaceae, Cyperaceae, palmaceae	Able to identify the major families of plants and their economic importance
III	Taxonomic tools	Herbarium- Techniques of plant preservation, Importance of herbarium, Botanical gardens- Role in plant taxonomy, Important Botanical gardens, Plant identification key-Types and use	Understand the methods of collecting and preserving plants

IV	Origin of Angiosperms	Place and Time of origin of angiosperms, Probable ancestors of Angiosperms: Benettitalean theory, Gnetalean theory, Pteridosperm theory	Learn the characters of taxa belonging to angiosperms and their comparative account of families
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Specify Course Outcome: Develop knowledge about different angiosperms, their families , taxonomic tools and origin

Specify Program Outcome: Plant Biodiversity awareness for students of universities and educational institutes.

Signature of Teacher