Dharmabad Shikshan Sanstha's
Lal Bahadur Shastri Mahavidyalaya, Dharmabad. 431809
Academic year 2018-19

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: Diversity of Microbes

Paper no : I

Unit Number	Unit Name	Topics	Unit-wise outcome
I	**Viruses and Mycoplasma**	General characters, classification based on host, Structure of plant viruses(TMV), Transmission of Viruses, Economic importance of virusesYellow vein Mosaic of Bhendi and Bean Mosaic; Mycoplasma:general characters, systematic position and structure, Little leaf of Brinjal; Prions;General Characters.	Students will differentiate between various groups of Bacteria, viruses
II	**Bacteria**	General characters, ultrastructure of bacterial cell, Mode of Nutrition, asexual reproduction by fission, sexual reproduction by conjugation; Cynobacteria: salient features, systematic position, habitat, distribution, strucuture and reproduction in Nostoc, Archaebacteria,Habit and forms, Economic importance of bacteria in industries, medicine and agriculture	Get knowledge abut bacteria and cyanobacteria life cycle and its uses
III	**Fungi**	General characters of fungi, classification of fungi(Alexopolous and mims 1979)type study, systematic position, occurrence, structure of mycelium, reproduction and graphic life cycle of Albugo and Eurotium	Student will learn individual life cycles of fungi

IV	**Fungi and Lichens**	Fungi: systematic position, occurrence, structure of mycelium, reproduction and graphic life cycle of Puccinia and Alternaria, Economic importance of fungi in Industries, medicine and food, agriculture; Lichens:general characters, classification, types and economic importance	Life cycles of fungi and lichens will be understood

Specify Course Outcome: Learn life cycles of individuals belonging to bacteria, fungi, algae, lichen and mycorrhiza

Specify Program Outcome: Students will be get motivated to conserve microbes, Cryptogamic Botany by this knowledge

Signature of Teacher

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Academic year 2018-19

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: Cell and Molecular Biology

Paper no : II

Unit Number	Unit Name	Topics	Unit-wise outcome
I	**Cell biology-I**	Introduction to cell biology, Ultrastructure of Prokaryotic and Eukaryotic cell, Ultrastructure and function of Nucleus, (nuclear membrane and Nucleolus), Ultrastructure and function of cell organelles:Golgi complex, lysosome, Endoplasmic reticulum and Ribosome	Knowledge about basic unit of life and its organelles
II	**Cell biology-II**	Chromosome: morphology, structure, chemical composition, euchromatin, Heterochromatin and function of typical chromosome, study of karyotype and ideogram of human being, structure and significance of giant chromosomes-Polytene and Lampbrush chromosomes, Cell division: cell cycle, Process and significance of mitosis and meiosis.	Complete knowledge about Chromosome and cell division processes with significance
III	**Molecular Biology-I**	Nucleic acids: Introduction, chemical composition,DNA:structure, (Watson and Crick), forms (A,B,Z) and semiconservative replication, (Meselson and Stahl experiment), RNA: Structure function and types	Student will learn about nucleic acids and its types with structure and function
IV	**Molecular Biology-II**	Gene concept: Classical (Morghan's view) Fine structure of gene (S. Benzer) Gene mutations (spontaneous and induced) and related diseases. (Transposable genetic elements, Phenylketonuria, Alkaptonuria, Albinism, Sickle cell anaemia, Amniocentesis (detection of genetic diseases)	Will get knowledge about genes its mutations with typical genetic diseases

Specify Course Outcome: Knowledge about basic unit of life, cell division processes, nucleic acids its types and genetic diseases.

Specify Program Outcome: Awareness about Molecular biology, Cell and its organelles along with complete knowledge about Chromosomes

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Academic year 2018-19

Pro-forma for program and course outcomes (2.6.1)

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

Department: Botany **Program: B.SC /FY**

Subject:**Botany** **Course Code**: CCB II SEC-A

Paper Title: Diversity of Cryptogams

Paper no : III

Unit Number	Unit Name	Topics	Unit-wise outcome
I	**Algae-I**	General characters of algae, classification of algae (As per F.E. Fritsch, 1935, Systematic position, occurrence, thallus structure, reproduction and graphic cycle wit alteration of generation of Oedogonium and Chara	Student will learn algae their classification life cycles
II	**Algae-II**	Systematic position, occurrence, thallus structure, reproduction and graphic cycle wit alteration of generation of Ectocarpus and Batrachospermum, Economic importance of algae (Food and Fodder)	Life cycle of algae can be understood by typical examples in addition to economic importance
III	**Bryophyta**	General characters of Bryophytes, Classification of Bryophytes (As per N.S. Parihar), Systematic position, Occurrence, thallus structure, (External and Internal), reproduction and graphic life cycle with alternation of generation of Riccia, Funaria (Developmental stages not expected), Economic importance of Bryophytes	Life cycles of Bryophytes, classification, typical genera knowledge

IV	**Pteridophyta**	General characters of Pteridophytes, Classification of Pteridophytes (As per N.S. Parihar), Systematic position, Occurrence,sporopyte structure, (External and Internal), reproduction and graphic life cycle with alternation of generation of Equisetum, Marsilea. (Developmental stages not expected)	Life cycles of pteridophytes, classification with typical examples

Specify Course Outcome: Knowledge about algae, bryophytes, pteridophytes could be taken along with some typical genera

Specify Program Outcome: Awareness about different life forms on earth by detail examination of their life cycle along with economic importance

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Academic year 2018-19

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-B

Paper Title: Genetics and Plant Breeding

Paper no : IV

Unit Number	Unit Name	Topics	Unit-wise outcome
I	**Genetics-I**	Genetic Inheritance:Mendelism, Mendel's laws of inheritance-Explanation and examples of monohybrid cross, dihybrid cross, Back cross and Test cross, Gene interaction, Epistasis-(Allelic and non Allelic), Explanationand examples of complementary gene action(9:7), Supplementary gene action (9:3:4), epistatic gene action (12:3:1) and Duplicate Gene Action (15:1), Sex determination: Discovery of sex chromosomes, Chromosomal theory of sex determination- in insects (XO-XX), Birds (ZW-ZZ method) Animals(Drosophila and Man), Plants (melandrium)	Basic knowledge about Mendels laws, different interactions
II	**Genetics-II**	Sex linked inheritance:definitin, classification (X-linked, Y-Linked, XY-linked), Sex linked inheritance in Drosophila Drosophila (white eye colour) and sex linked inheritance in man (haemophilia, colourblindness) Holandric gene-Hypertrichosis and sex linked inheritance in Birds-Barred feathers. Chromosomal aberrations(numerical): Polyploidy (Haploids, diploids, Triploids tetraploids, and polyploids) Euploidy-Autopolyploidy, Allopolyploidy, with reference to Raphanobrassica and Hexaploid Wheat, Aneuploidy(hyper and hypoploidy) Human syndromes (autosomal and sex chromosomal syndromes) Down's syndrome, Turner's syndrome, Klinefelters syndrome	Students will know about linked interactions Also about abnormalities in chromosome numbers along with some syndromes

III	**Plant Breeding -I**	Introduction, objective of plant breeding, Methods of plant breeding: Selection-Mass selection, Pure line selection, clonal selection, Hybridization: definition, objectives, various steps and application ,Heterosis-definition, effects, utilisation and limitation	Basic breeding technology could be known in addition to some process of hybridisation
IV	**Plant Breeding-II**	Plant introduction and Acclimatization: Introduction, types, advantages and disadvantages, mutational breeding: Objectives,Procedure and application, methods of mutational breeding with reference to groundnut, Male sterility: Genetic male sterility, Cytoplasmic male sterility	Students will get knowledge about plant breeding methods

Specify Course Outcome: Knowledge about chromosomal abnormalities, breeding methods, Mendels laws of inheritance and understanding different interactions

Specify Program Outcome: Recent techniques known by students basically of breeding methods so that how new varieties are produced in plant sciences. Chromosomal number importance

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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 /SY**

Subject:**Botany** **Course Code**: CCBIII-SEC A

Paper Title: Morphology and Taxonomy of Angiosperms

Paper no : VI

Unit number	Unit Name	Topics	Unit-wise outcome
I	**Morphology of Angiosperms**	**Root:** Definition, characters, types (tap root 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 a 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 (etaerio of berries), composite (sorosis)	Student will learn about morphological characters of different parts of plant in detail

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 & Hooker and Engler & Prantl's system of classification with merits and demerits	Plant Classification types typically Bentham and Hooker's one
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 & Hooker's system), distinguishing characters and economic importance of plants (at least two) of the Families-**Annonaceae, Brassicaceae, Malvaceae, Meliaceae, Caesalpinaceae, Fabaceae, Apiaceae.**	Awareness about different families and their identification
IV	**Study of Families-II**	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 & Hooker's system), distinguishing characters and economic importance of plants (at least two) of the Families-**Asteraceae, Solanaceae, Euphorbiaceae, Lamiaceae, Liliaceae and Poaceae**	Student will get knowledge about different families, parts of a reproductive structure

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 2018-19

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-SECB

Paper Title: Histology, Anatomy and Embryology of Angiosperms

Paper no : VII

Unit Number	Unit Name	Topics	Unit-wise outcome
I	**Histology**	**Meristematic Tissue:** Definition, classification based on position and origin, Histological organization of root and shoot apices, Apical cell theory, Histogen theory and Tunica corpus theory. **Simple Tissues:** Parenchyma, Collenchyma, Sclerenchyma. **Complex tissues:** Xylem and Phloem. **Secretary 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), **Leaf** anatomy of Monocotyledons (Maize) and Dicotyledons (Sunflower), **Secondary Growth**- Normal Secondary growth in root and stem of Dicotyledons (Sunflower), **Anomalous Secondary growth** in Achyranthes stem and Dracaena stem.	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**	Megasporogenesis, Development of **Monosporic** (Polygonum type), **Bisporic** (Allium type) and **Tetrasporic** (Adoxa type) female gametophytes, **Fertilization-** Double fertilization 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 fertilization changes)	Student learn embryology and micro sporogenesis and megasporogenesis, fruit formation and seed formation

Specify Course Outcome: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 2018-19

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 IV-SEC A

Paper Title: Gymnosperms and Paleobotany

Paper no : VIII

Unit number	Unit Name	Topics	Unit-wise outcomes
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	**Palaeobotany**	Introduction to palaeobotany, process of plant fossilization, types of fossils, geological time scale, Study of fossil Gymnosperms- ***Lyginopteris oldhamia*** (stem), ***Bennettites*** (flower) and General characters of ***Ginkgo*** (A living fossil).	Student will learn about the characters of taxa belonging to fossil

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 no : 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 Acaptations in Plants**	Morphological, anatomical and physiological responses of plants to water, Morphological and anatomical adaptation in Hydrophytes (Hydrilla stem and Nymphea 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, soil 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 envrironment and its conservation

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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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 number : XII

Unit Number	Unit Name	Topics	Unit-wise Outcome
I	**Plant water relations**	Importance of water in plant life Different biophysical 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 Nastic movements	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**	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. Seed dormancy: Introduction, causes of seed dormancy and methods of breaking seed dormancy Seed germination: introduction, types and mechanism of seed germination. Physiology of flowering: Introduction, Photoperiodism (LDP, SDP and DNP). Vernalization and devernalization: Introduction, mechanism and significance.	Knowledge about growth, development, plant growth hormones Knowledge about flower production
IV	**Biomolecules and secondary metabolites**	Biomolecules: Carbohydrates: Introduction, structure and classification, monosaccharides, disaccharides and polysaccharides (starch and cellulose) Protein: introduction, classification and biological functions of Primary, secondary (alpha helix and beta sheets), tertiary and quaternary structure. Lipids: Introduction, structure classification and biological functions of lipids Secondary metabolites: Biological functions of tannins, terpenoids, flavonoids, alkaloids, essential oils and organic acids	Learning biomolecules and secondary metabolites

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 2018-19

Pro-forma for program and course outcomes (2.6.1)

Name of Teacher: Dr.D.R. More + Mr. 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 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	Students will identify the major families of plants and their economic importance

IV	**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.	Able to identify the major families of plant and their economic importance

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.

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Academic year 2018-19

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 photophoshorylation, 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, Kreb's cycle, Electron Transport System. Anaerobic respiration- Fermentation (alcoholic and lactic acid)	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 denitrification	Students will learn about enzymes, mechanism of enzyme action with regulations Basic knowledge about Nitrogen metabolism

III	**Biotechnology**	**Tissue culture:** Introduction and basic aspects of tissue culture, media, culture techniques, cellular totipotency. **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	Student will learn about tissue culture and different application
IV	**Genetic engineering**	Introduction, tools and techniques of recombinant DNA technology, Cloning vectors, Gene cloning, Genomic library and cDNA library, *Agrobacterium* mediated gene transfer, transgenic plants. **Bioinformatics:** Introduction, Biological database, NCBI, BLAST.	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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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 /TY,**

Subject:**Botany** **Course Code**: DSEB-II SEC-B

Paper title: Systematic Botany-II

Paper no : XV

Unit number	Unit Name	Topics	Unit-wise outcome
I	**Study of Dicot families**	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 Rubiaceae, Apocynaceae, Convolvulaceae, Bignoniaceae, Acanthaceae, Verbenaceae	Able to identify the major families of plants and their economic importance
II	**Study of Dicot families (Polypetalae)**	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, combretaceae, Myrtaceae, Rutaceae, Minosaceae, Cucurbitaceae Nyctaginacreae (Monochlamydeae)	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

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