B.Sc. Botany

Program Specific Outcome

After Completion of the program Students with able to :

PSO1	Identify the diversity of plants, and discuss their importance for human existence and sustainability
PSO2	Understand the fundamental concepts of plant science and apply them with the emerging trends such as Taxonomy, Molecular biology, Biotechnology Bioinformatics and Environment Science
PSO3	Demonstrate the Instrumentation techniques and analytical skills compute the experimental data using statistical methods,
PSO4	Develop proficiency in Plant identification, genetic analysis, environment consultancy, Employ the horticultural and managerial skills to setup business and develop as an entrepreneur
PSO5	Develop research aptitude and scientific communication
PSO6	Apply various laboratory practices and procedures, Assess the biodiversity, solve environment related issues, and practice bioethics

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Department	Semester	Course
Botany	I	Botany-I Paper I -- Plant Diversity 1

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Study, identify and understand the range of thallus in algae and acknowledge the economic importance of algae.	L1, L2, L4	PO1, PO2, PSO1, PSO2
CO2	Explain the concepts of Fungi- Phycomycetes - Identify and classify fungi and also understand the different modes of nutrition in them and determine applications in medicines and biotechnology.	L5, L2, L3, L4	PO1, PSO1, PSO4, PSO5
CO3	Define, identify and analyze the life cycles of Riccia.	L1, L4	PO1, PSO1, PSO4

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Department	Semester	Course
Botany	I	Botany-II Paper II – Form and Function 1

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Understand and identify the basic components of cells, cell organelles and their structure, and functions and enlist their importance.	L1, L2	PO1, PSO1, PSO2
CO2	Develop an understanding of various concepts in Ecology, acquire the knowledge of basic ecological concepts of energy flow, pyramids, types of ecosystems	L2	PO1, PSO1, PSO2, PSO5
CO3	Identify the basics of inheritance and understand the concepts in genetic variations and compare it with its modified ratios. Analyze the inheritance of multiple alleles.	L2, L1	PO1, PSO1, PSO2, PSO3, PSO6

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Department	Semester	Course
Botany	I	Botany-II Practical- Paper I Plant Diversity I Paper II -- Form and Function 1

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Observe the structure and diversity of algae, fungi, and lichens along with their economic importance.	L1, L4	PO1, PO2, PSO1, PSO2, PSO5
CO2	Learn the structures in bryophytes, pteridophytes and lichens and acknowledge their economic and ecological significance.	L2, L4	PO1, PSO2, PSO5
CO3	Observe and identify the different stages of mitosis. Understand the ecological adaptations to different environmental conditions, groups of plants and their identification. Apply the skills of data representation and solve the problems in biometry.	L3	PO2, PO3, PO4, PSO3
CO4	Evaluate, understand the inheritance patterns in genetics and work out the problems based on the same. identify the karyotypes and cell components	L5, L2	PO1, PO2, PSO2, PSO3

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Department	Semester	Course
Botany	II	PLANT DIVERSITY

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	understand the characteristics of Pteridophytes, ability to differentiate the different types of stele and assess the pattern of evolution of stele in higher plants	L1, L2, L4	PO1,PO2, PSO1, PSO2,PSO5
CO2	understand , classify and describe the structure and life cycle pattern ofGymnosperm,	L1, L2, L3	PO1, PSO1,PSO5
CO3	categorize the different types of leaves and inflorescence based on morphology, understand the technical terms used to describe the plant in taxonomy and write the floral formula, Conduct field surveys	L3, L4	PO1, PO3,PO4, PO6, PSO1 PSO4,PSO5, PSO6

Department	Semester	Course
Botany	II	FORM AND FUNCTION I

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	understand and draw the internal structure of plant organs, differentiate the dicot and monocot plants on the basis of anatomical structure	L1/L2	PO1,PO6, PSO1,PSO5, PSO6
CO2	understand , classify and describe the structure and life cycle pattern of Cycas plant, economic importance of gymnosperms	L1, L2	PO1, PSO1, PSO6
CO3	define and understand the concept of metabolites, apply the knowledge of primary and secondary metabolites for therapeutic uses determine the use of medicinal plants,	L1, L2, L3,L4	PO1, PO4,PO5, PO6, PSO1,PSO2, PSO4,PSO5, PSO6

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Department	Semester	Course
Botany	II	PRACTICAL PAPER 1 AND 2

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	identify, classify and describe the pteridophyte and Gymnosperm differentiate between different stele and analyze their evolutionary relationship	L1, L2,L3	PO1,PO4, PO5, PO6, PSO1,PSO5, PSO6
CO2	understand the technical terms in Taxonomy and employ the knowledge to categorize the angiospermic plants , draw and illustrate, compare the internal structure of dicot and monocot plants, understand the epidermal outgrowths and stomata,	L1, L2, L3	PO1,PO4, PO5,PO6, PSO1, PSO4, PSO5, PSO6
CO3	Understand the principle and technique of chromatography and analyze the presence of organic compounds by chromatography identify and apply the knowledge of plants for pharmaceutical and medicinal uses,ability to detect the presence of secondary metabolite	L1, L2, L3,L4	PO1,PO2,PO3,PO4, PSO1,PSO2, PSO3, PSO4, PSO5, PSO6

Department	Semester	Course
Botany	III	Botany-I Paper I -- Plant Diversity-II

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Classify, Identify and understand the life cycles of algae and bryophytes with their economic importance.	L1, L3, L4	PO1, PSO1, PSO2
CO2	Classify and Identify angiosperms based on Bentham & Hooker's system of classification. Understand the floral morphology and economic importance of various angiosperms.	L1, L3, L4,	PO1, PO2, PSO1, PSO2
CO3	Understand the principle and techniques of microscopy and chromatography. Understand and apply the principle of gel electrophoresis.	L2, L3	PO1, PO2, PSO2, PSO3

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Department	Semester	Course
Botany	III	Botany-II Paper II -Forms and functions -II

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Understand the structure and function of cell organelles, nucleic acids. Analyze the cell divisions with the knowledge of cell cycle and its control mechanism.	L2	PO1, PO2, PO4, PSO2, PSO4, PSO5
CO2	Analyze, identify and evaluate the cytological and genetic effects chromosomal aberrations, and pattern of maternal inheritance. Learn and analyze the concepts of sex determination, sex linked, and sex influenced- sex limited traits	L1, L2, L4	PO1, PO2, PO4, PSO2, PSO4, PSO5
CO3	Understand the structure and function of DNA Replication in Prokaryotes and Eukaryotes. Learn the process of protein synthesis.	L2	PO1, PO2, PO4, PSO2, PSO4, PSO5

Department	Semester	Course
Botany	III	Paper III (Current Trends in Plant Sciences I)

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Know the concepts of Pharmacognosy, Pharmacopoeia and Monographs and evaluate the scope of Ayurveda system.	L1, L4	PO1, PSO1, PO4, PSO2, PSO4, PSO5
CO2	Understand and differentiate between basic and modern trends in forestry. Acquire and apply the knowledge of ecotourism.	L3, L4	PO1,PO2, PSO1, PO4, PSO2, PSO4, PSO5
CO3	Identify and appreciate the knowledge of commercially important plants. Acknowledge the potential of aromatherapy, botanicals and nutraceuticals. Apply the knowledge of plant-based enzymes in industry and biofuels	L2, L4	PO1,PO2, PSO1, PO4, PSO2, PSO4, PSO5

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Department	Semester	Course
Botany	III	Practical I (Plant Diversity II), Practical II (Form and Function II) & Practical III (Current Trends in Plant Sciences I)

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Identify, Understand and observe the structural features in algae and bryophytes; Identify different morphological variations in the floral structures and learn angiosperm families with economic importance. Classify and apply modern techniques in plant diversity studies.	L1, L3, L4	PO1, PO3, PO4, PSO1, PSO4, PSO5,PSO6
CO2	Analyze and understand the ultrastructure of cell organelles, nucleic acids, inheritance pattern & chromosomal aberrations. Observe and apply the concepts of ecological experimentations.	L1, L2, L4	PO1,PO2, PSO1, PSO2, PSO5
CO3	Understand the plant wealth, plant diversity, forest types through field visits and ecotourism..	L2, L3, L4	PO1, PO2, PO3, PO4, PSO1, PSO2, PSO4, PSO6
CO4	Analyze the phytochemical constituents and pharmaceutical uses of plants . Differentiate and acknowledge the significance of herbal drugs with their adulterants & economic importance	L2, L3, L4	PO1,PO2, PO4, PSO1, PSO2, PSO4, PSO5

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Department	Semester	Course
Botany	IV	PLANT DIVERSITY II

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	illustrate and describe the thallus structure and modes of reproduction in Fungi, examine the fungal diseases in plants and recommend the control measures and be competent in various aspects of plant pathology	L1, L2, L3,	PO1, PO3,PO6, PSO1, PSO2 PSO5,PSO6
CO2	understand the characteristics of Pteridophytes and classify up to its orders, comprehend the process of fossilization, ability to distinguish different types of fossils	L2, L4,	PO1, PO4, PSO1,PSO3, PSO5
CO3	understand , classify and describe the structure and life cycle pattern of Gymnosperm	L1, L2	PO1, PO3, PO4, PSO1 PSO4,PSO5, PSO6
CO4	illustrate and describe the thallus structure and modes of reproduction in Fungi, examine the fungal diseases in plants and recommend the control measures and be competent in various aspects of plant pathology	L1, L2, L3,	PO1, PO3,PO6, PSO1, PSO2 PSO5,PSO6

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Department	Semester	Course
Botany	IV	FORM AND FUNCTION II

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	ability to understand the functioning of various tissue system in plants, ability to list the different types of vascular bundles in plants, explain the mechanism of secondary growth in plants, evaluate the arrangement and structural components of mechanical tissue systems with respect to their functions, Design models or diagrams illustrating the organization and function of mechanical tissue systems in plants.	L1, L2, L4	PO1, PO4, PO6, PSO1, PSO5,PSO6
CO2	ability to define and describe the process of glycolysis, Kreb's Cycle, ETS and anaerobic respiration; Construct models or diagrams illustrating the interconnectedness of glycolysis, Krebs cycle, ETC, and photorespiration within plant metabolism. and analyze how modifications to the these metabolic pathways could enhance plant productivity	L1, L2, L3, L4	PO1,PO2, PO4, PO5,PO6, PSO1,PSO2, PSO5,PSO6
CO3	list the key enzymes and factors involved in Transcription, apply the knowledge of transcription mechanism to interpret gene expression in organisms considering the ethical values	L1, L3,	PO1,PO2, PO6, PSO1,PSO2, PSO4,PSO5, PSO6

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Department	Semester	Course
Botany	IV	CURRENT TRENDS IN PLANT SCIENCE I

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	ability to understand the garden features, list the various plants for the different garden features amd apply this knowledge to design a garden layout, business planning	L1, L2, L3	PO1, PO3, PO4, PSO1,PSO4, PSO5,PSO6
CO2	ability to acquire the basic techniques in plant tissue culture and apply these skills for entrepreneurship, collaborations with other industries	L1, L3	PO1,PO2, PO4, PO6 PSO1,PSO2, PSO3,PSO4, PSO5,PSO6
CO3	ability to analyze and interpret the biological data using statistical methods and bioinformatics	L3, L4	PO1,PO2,PO3,PO4, PSO1,PSO2, PSO3,PSO4, PSO5,

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Department	Semester	Course
Botany	IV	PRACTICAL PAPER 1 , 2 AND 3

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Identify and describe the structure of the members of Fungi, Pteridophytes and Gymnosperms. Examine the fungal diseases in plants and recommend the control measures and identify and describe lichens	L1, L2,L3	PO1, PO4, PSO1, PSO4, PSO5, PSO6
CO2	explain the mechanism of secondary growth in plants, Design models or diagrams illustrating the organization and function of mechanical tissue systems in plants.	L1, L2,	PO1,PO4, PO5,PO6, PSO1, PSO4, PSO5, PSO6
CO3	Demonstrate the physiological processes in plants, analyze the soil properties and recommend measures for ecosystem management	L2, L3,L4	PO1,PO2,PO4, PO6, PSO1, PSO4, PSO5, PSO6
CO4	Design a garden layout with garden features and plants suitable for it, prepare terrarium, skillfully carryout micropropagation technique,solve problems related to biostatistics and bioinformatics	L1, L2, L3,L4	PO1,PO2,PO3, PO4, PO5, PSO1, PSO2, PSO3, PSO4, PSO5, PSO6

Department	Semester	Course
Botany	V	Botany-I Paper I -- Plant Diversity-III

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Apply and gain knowledge about microbial diversity and techniques for culturing and visualization.	L1, L2	PO1, PO2, PO4, PSO1,
CO2	Understand the salient features of three major groups of algae, their life cycle patterns with a suitable example; to be able to identify them	L1, L2	PO1, PO4, PSO1, PSO2
CO3	Learn the general characteristics and classification of two major groups of fungi along with life cycles of each group; to be able to identify them.	L3,	PO1, PO2, PSO1, PSO2, PSO4
CO4	Identify and understand the scope and importance of Plant Pathology and apply the concepts of various control measures of commonly widespread plant diseases.	L2, L3	PO2, PO4, PSO2, PSO4

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Department	Semester	Course
Botany	V	Botany-II Paper II- PLANT DIVERSITY – IV

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Understand and acquire knowledge of different fossil forms and understand their role in evolution.	L1, L2	PO1, PO2, PO4, PSO5
CO2	Identify and provide plant description, describe the morphological and reproductive structures of seven families and also identify and classify according to Bentham and Hooker's system	L1, L3	PO2, PSO1, PO4, PSO4
CO3	Learn to gain proficiency in the use of keys and identification manuals for identifying any unknown plants to species level.	L1	PO1, PO2, PO3, PSO1, PSO4
CO4	Understand to relate anomalies in internal stem structure with function and appreciate the salient features of the root stem transition zone. To get exposure to pollen study and learn to apply it in various fields	L2	PO1, PO2, PSO2, PSO4

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Department	Semester	Course
Botany	V	Botany-III Paper III- FORM AND FUNCTIONS- II

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Acquire knowledge about two important organelles and molecular mechanisms of translation	L1	PO1, PSO1, PSO2
CO2	Understand water relations of plants, inorganic and organic solute transport, and apply the knowledge to manage mineral nutrition and survival in challenging abiotic stresses.	L2, L4	PO1, PO2, PSO5, PSO2
CO3	Identify, observe and understand succession in plant communities and study remediation technologies in order to apply knowledge acquired for clean-up of polluted sites.	L1, L4	PO1, PO4, PSO1,
CO4	Understand to get exposure to principles and techniques of plant tissue culture and apply these studies for improving agriculture and horticulture and to become an entrepreneur.	L3	PO1, PO2, PSO4, PSO1

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Department	Semester	Course
Botany	V	Botany-IV Paper IV-CURRENT TRENDS IN PLANT SCIENCES – II

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Understand to learn the technique of mushroom cultivation and explore the possibility of entrepreneurship in the same	L2	PO1, PO2, PO4, PSO1, PSO2,PSO4, PSO6
CO2	Acquire the knowledge of ethnobotanical principles, applications and utilize indigenous plant knowledge for the cure of common human diseases and improvement of agriculture.	L3, L4	PO1, PO2, PO4, PSO1, PSO2, PSO4, PSO6
CO3	Understand and to gain knowledge about the latest molecular biology techniques for isolation and characterization of genes.	L2, L3	PO1, PO2, PSO1, PSO2, PSO6
CO4	Apply and analysis of principles and application of commonly used techniques in instrumentation. To gain proficiency in the monograph study and pharmacogenetic analysis of six medicinal plants.	L3, L4	PO1, PO2, PO6, PSO1, PSO2, PSO3, PSO6

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Department	Semester	Course
Botany	V	Botany-IV Applied Component- Horticulture & Gardening I

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Understand the definition, importance and objectives of Horticulture, branches of Horticulture	L1, L2	PO1, PO2, PSO1, PSO2, PSO6
CO2	Learn the methods of seed propagation.	L1, L2	PO1, PO2, PSO2
CO3	Understand and gain knowledge about the definition, importance, important manures	L1, L2	PO2, PSO2, PSO6
CO4	Identify and learn principles and application of various techniques in garden operations.	L1, L3, L4	PO2, PO4, PSO2, PSO6

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Department	Semester	Course
Botany	V	Practical Paper I -- Plant Diversity-III And Botany-II (USBO502): Practical Paper II- PLANT DIVERSITY – IV

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Classify, Identify and understand the life cycles of fungi and learn techniques to identify	L2, L3	PSO1, PO2, PSO2, PSO5
CO2	Classify and identify and to Study stages in the life cycle of the following Algae from fresh / preserved material and permanent slides. Learn to identify the different fungal diseases	L2, L3, L4	PO1, PO2, PSO2
CO3	Learn to study the anomalous secondary growth in the stems of the following plants using double staining technique. Understand and acquire knowledge of different fossil forms and understand their role in evolution with the help of permanent slides/ photomicrographs.	L2, L3	PO1, PO2,PO4, PSO1, PSO2, PSO5
CO4	Learn to study the anomalous secondary growth in the stems of the following plants using double staining technique. Understand to relate the study of pollen morphology (NPC Analysis) of the following by Chitale's Method	L1, L3	PO1, PO2,PO4, PSO1, PSO4

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Department	Semester	Course
Botany	V	Practical Paper III- FORM AND FUNCTIONS- III and Paper IV-CURRENT TRENDS IN PLANT SCIENCES – II

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Learn the skill of preparing slides of Mitosis and to predict the sequence of amino acids in the polypeptide chain that will be formed following translation. Understand water relations of plants, by estimation of phosphorus and iron from plant extract.	L1, L2	PO1, PO2, PO4, PSO1, PSO2
CO2	Understand and evaluate the water quality analysis by total dissolved oxygen, biological demand of oxygen, hardness and salinity. Understanding to get exposure to principles and techniques of plant tissue culture for acquiring knowledge of Identification of – Multiple shoot culture, hairy root culture, somatic embryogenesis.	L2, L3	PO1, PO2, PSO1, PSO2,PSO3, PSO4
CO3	Identification of various stages involved in mushroom cultivation. Learn the techniques in biotechnology -growth curve phases of bacteria Acquire and gain knowledge about the latest molecular biology techniques for isolation and characterization of genes.	L2, L3, L4	PO1, PSO1,PSO2, PSO4, PSO5
CO4	Acquire the knowledge of ethnobotanical principles, applications and utilize indigenous plant knowledge for the cure of common human diseases and improvement of agriculture	L2, L4	PO1, PO2, PO6, PSO1, PSO2, PSO6

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Department	Semester	Course
Botany	V	Practical Applied Component- Horticulture & Gardening I

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Understand the definition, importance and objectives of garden implements and their uses	L1, L2	PO1, PO2, PSO1, PSO2, PSO4
CO2	Learn the methods of – Identification of manures by physical and chemical methods	L3, L4	PO1, PO6, PSO2, PSO3, PSO4
CO3	Understand and gain knowledge about methods of preparing bonsai, Bottle Garden / Terrarium, Hanging baskets, dish garden.	L2, L4	PO1, PO2, PO4, PSO1
CO4	Identify and learn measures of diseases and pests on plants by preparation of natural insecticides , Project work to understand the importance of any topic related to Horticulture	L2, L3, L4	PO1, PO2, PO3, PO4, PO5, PSO1, PSO2, PSO4 PSO5

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Department	Semester	Course
Botany	VI	PLANT DIVERSITY I

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Identify, describe the characteristics of Bryophytes, illustrate the life cycles of Bryophytes, Interpret the significance of alternation of generations in bryophyte	L1, L2, L3	PO1, PO4, PSO1,
CO2	identify and describe the life cycles of three genera of Pteridophytes, Apply taxonomic principles to identify and classify examples of Lepidophyta, Calamophyta, and Pterophyta.	L1, L2, L3	PO1, PO4, PSO1,
CO3	Understand the economic importance of bryophytes and pteridophytes, Apply knowledge of bryophyte ecology to propose strategies for conservation and habitat restoration. Analyze the evolution of sori in pteridophyte and employ knowledge of sori morphology to identify and classify pteridophyte taxa.	L1, L2, L3, L4	PO1, PO4, PO5,PO6, PSO1,PSO2, PSO4, PSO5, PSO6
CO4	Classify and describe the structure and life cycle pattern of Gymnosperm, Interpret the significance of alternation of generations in Gymnosperms, apply the knowledge of economic importance of gymnosperms	L1, L2	PO1, PO4, PSO1, PSO5, PSO6

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Department	Semester	Course
Botany	VI	PLANT DIVERSITY IV

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	List the major botanical gardens of India, summarize the role of botanical gardens in conservation, education, and research. Apply the Bentham and Hooker classification system to identify and classify plant families in botanical specimens Analyze the strengths and limitations of the Bentham and Hooker classification system	L1/L2, L3, L4	PO1,PO2, PO4, PO6,PSO1,PSO2, PSO4,
CO2	gain comprehensive knowledge of anatomical features of plants,define ecological anatomy and explain the diversity of ecological adaptations across plant species ,	L1, L2	PO1, PSO1,
CO3	Describe the sequential steps involved in microsporogenesis and Megasporogenesis, Apply knowledge of embryo sac structure to interpret micrographs or diagrams showing different developmental stages.	L2, L3	PO1, PO2, PSO1, PSO2
CO4	Name the phytogeographical regions of India, describe the diversity of flora in different phytogeographical zones, Apply knowledge of biodiversity to propose strategies for conserving and restoring ecosystems. analyze the relationships between different levels of biodiversity and their impact on the ecosystem	L1, L2, L3, L4	PO1, PO4, PO5, PO6, PSO1, PSO2, PSO3, PSO4, PSO5, PSO6

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Department	Semester	Course
Botany	VI	PRACTICAL I - PLANT DIVERSITY III AND PLANT DIVERSITY IV

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Identify, classify and Describe the morphological features of vegetative and reproductive structures of Bryophytes , Pteridophytes and Gymnosperms and differentiate them	L1, L2	PO1, PO4, PSO1,PSO5, PSO6
CO2	gain comprehensive knowledge of economic importance of Bryophytes and pteridophytes, categorize the different pteridophytes on the basis of sori	L1, L2, L4	PO1,PO4, PO6, PSO1,PSO2, PSO4, PSO6
CO3	Identify the morphological peculiarities and Classify plants using Bentham and Hooker's classification system, Apply knowledge of angiosperm families to identify and classify plants in the field or herbarium.	L1, L2, L3	PO1,PO2, PO3, PO4, PO5, PO6,PSO1 ,PSO2, PSO3, PSO4, PSO5,PSO6
CO4	understand the anatomical features of plants in different habitats, interpret the ecological adaptations, Identify Describe and sketch the different stages of microsporogenesis and megasporogenesis, Show the phytogeographical regions of India on map, calculate simpson's diversity index and interpret	L2, L3	PO1,PO2,P O3, PO4, PO6,PSO1, PSO4, PSO6

Satish Pradhan Dnyanasadhana College, Thane
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Department	Semester	Course
Botany	VI	FORM AND FUNCTION III

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Classify biomolecules, describe structural characteristics of carbohydrates, lipids and proteins,understand the mechanisms of enzyme catalysis and the factors affecting enzyme activity.	L1, L2,	PO1, PSO1, PSO2, PSO5
CO2	understand the nitrogen metabolism pathway in plants, apply this knowledge to propose strategies for optimizing efficient use of nitrogen in crop cultivation, List the different types of PGRsand explain the mechanism in regulating plant growth processes, analyze the physiological responses of plants to application of PGRs	L1, L2, L3,L4	PO1, PO2,PO4,PO6 PSO1, PSO2, PSO5,PSO6
CO3	understand the principles of genetic mapping, mutations, solve problems based on them, gain knowledge of various metabolic disorders and their implications	L2, L3,	PO1, PO2, PSO1, PSO2,PSO3, PSO4, PSO5
CO4	understand the basic principles and concept of biostatistics, Describe the applications and significance of ANOVA, regression, and t-test, apply this understanding to analyze biological data and experimental designs.	L1, L2, L3	PO1,PO2, PO4, PSO1, PSO3, PSO5

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Department	Semester	Course
Botany	VI	CURRENT TRENDS IN PLANT SCIENCE II

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	gain insights into molecular biology techniques for DNA analysis, apply knowledge of DNA barcoding for species identification or taxonomic studies.Critically analyze the ethical and practical implications associated with the use of DNA barcoding for conservation and biodiversity management.	L1, L2, L3, L4	PO1,PO2, PO4,PO6, PSO1, PSO2, PSO3, PSO5,PSO6
CO2	understand the organization of databases, explain BLAST and construction of phylogenetic tree, protein structure analysis, apply the Bioinformatics tools for data retrieval and phylogenetic analysis	L1, L2, L3	PO1, PO2, PO4, PSO1, PSO2, PSO3, PSO4
CO3	State the sources of oils and fats from economically important plants in the field of economic Botany, demonstrate the extraction of oils dealing with entrepreneurship in the field	L1, L3, L4	PO1,PO4, PO5, PSO1, PSO2, PSO6
CO4	acquire comprehensive knowledge and proficiency in preservation of post harvest produce and explore entrepreneurship in the field	L2, L3	PO1,PO4, PSO1, PSO4

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Department	Semester	Course
Botany	VI	PRACTICAL III and IV

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Describe the mechanism of physiological process, and demonstrate the reactions involved, Define and employ the principles of Biochemistry to perform biochemical assays,	L2, L3	PO1, ,PO3, PO4,PO5, PSO1, PSO2, PSO3, PSO4,PSO5,
CO2	Apply the principles of the three-point test cross to interpret experimental data and determine gene order and prepare chromosome map,Apply the principles and formulae of Biostatistics, Analyze the results of ANOVA, regression, and t-test analyses to identify patterns, trends, and relationships in biological data.	L2, L3,L4	PO1, PO2,PO4, PSO1, PSO2, PSO3,PSO4, PSO5
CO3	Identify understand and analyze DNA barcoding sequences to identify gene sequence and assess genetic diversity; Analyze BLAST search results and sequence alignments to identify conserved motifs, domains, or functional regions., Employ multiple sequence alignment tools to align and compare sequences for evolutionary and functional analysis	L1, L2, L4	PO1, PO2,PO3, PO4, PSO1, PSO2, PSO3, PSO4,
CO4	Demonstrate extraction of oil, analyze the organic compounds by chromatography;employ the knowledge of food preservation techniques	L3, L4	PO1,PO4, PO5,PO6, PSO1, PSO2, PSO4,PSO6

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Department	Semester	Course
Botany	VI	APPLIED COMPONENT- HORTICULTURE AND GARDENING II

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	Explain the principles of landscape gardening, Evaluate plant species suitable for various garden features,	L2, L4	PO1,PO2, PO4, PSO1,PSO2, PSO4
CO2	understand the basic principles of green house technology, identify the different types of greenhouse structures, apply the green house management technique for developing green house, assess the environment sustainability, setup and practice the floriculture business	L1, L2, L3	PO1, PO2, PO4, PO6,PSO1, PSO2, PSO4, PSO6
CO3	summarize and demonstrate the various cultivation techniques, Review and assess the market trend and importance of commercial production of fruits, vegetables and medicinal plants, use integrated pest management strategies and organic farming	L1, L3, L4	PO1,PO3, PO4,PO5,PSO1,PSO2, PSO4,PSO5, PSO6
CO4	understand the importance of post harvest technology, analyze the factors affecting post harvest food losses, manipulate strategies to minimize food loss and increase market value, Apply market research techniques to assess the demand for horticultural products, acquire the knowledge and skills for horticultural business planning and entrepreneurship development	L2, L3, L4, L5	PO1, PO4, PO5, PO3, PO6,PSO2, PSO3, PSO4, PSO6

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Department	Semester	Course
Botany	VI	APPLIED COMPONENT- HORTICULTURE AND GARDENING II PRACTICAL

After completing the course, Students will be able to:-

CO No.	Course Outcome	Bloom's Level	Mapping of PO & PSO's
CO1	design and plan a comprehensive garden layout, demonstrate the skill of using different color, form and plant species at various locations	L3, L4, L4	PO1,PO2, PO4, PSO1,PSO2, PSO4
CO2	Recall the names of flowers used in different flower arrangements, acquiring knowledge and entrepreneurial skills in flower arrangement apply skills to create aesthetic flower arrangements,	L1, L3, L4	PO1, PO2, PO4, PO6, PSO1, PSO2, PSO4, PSO6
CO3	explain the importance of color, texture and form of material in biojewellery, create unique designs,assess the environmental sustainability of material used in biojewellery	L2, L3, L4	PO1,PO3, PO4,PO5,PSO1,PSO2, PSO4,PSO5
CO4	acquire and develop the entrepreneurial skills of fruit and vegetable carving, employ the food preservation techniques	L2, L3, L4	PO1, PO4, PO5, PO3, PO6, PSO2, PSO3, PSO4, PSO6