

**B.L.D.E.ASSOCIATION'S
SB ARTS AND K.C.P. SCIENCE COLLEGE, VIJAYAPUR
RE-ACCREDITED AT THE 'B⁺⁺' LEVEL**

Bachelor of Science (Botany)

PROGRAM OUTCOMES

POs	Description
PO1:	Skill development for the proper description using botanical terms, identification, naming and classification of life forms especially plants and microbes.
PO2:	Acquisition of knowledge on structure, life cycle and life processes that exist among plant and microbial diversity through certain model organism studies
PO3:	Understanding of various interactions that exist among plants and microbes; to develop the curiosity on the dynamicity of nature
PO4:	Understanding of the major elements of variation that exist in the living world through comparative morphological and anatomical study
PO5:	Ability to explain the diversity and evolution based on the empirical evidences in morphology, anatomy, embryology, physiology, biochemistry, molecular biology and life history
PO6:	Skill development for the collection, preservation and recording of information after observation and analysis- from simple illustration to molecular database development.
PO7:	Making aware of the scientific and technological advancements- Information and Communication, Biotechnology and Molecular Biology for further learning and research in all branches of Botany..
PO8:	Internalization of the concept of conservation and evolution through the channel of spirit of inquiry.
PO 9:	To enable the graduates to prepare for national as well as international level competitive examinations like UGC-CSIR, UPSC, KPSC etc.
PO10:	To enable the students for practicing the best teaching pedagogy as a biology teacher including the latest digital modules.
PO 11:	The graduates should be knowledgeable and competent enough to appropriately deliver on aspects of global importance like climate change, SDGs, green technologies etc at the right opportunity.
PO 12:	The graduate should be able to demonstrate sufficient proficiency in the hands-on experimental techniques for their area of specialization within biology during research and in the professional career.

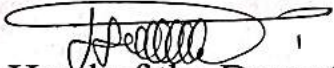
Course outcomes


CLASS	PAPER	COURSE OUTCOMES	DESCRIPTIONS
B. SC. I SEM NEP	Microbial diversity and Technology (Theory) 21BSC1BOT1L		This course will enable the students to
		CO1	Students will learn concept of understand the fascinating diversity, evolution and significance of microorganisms
		CO2	Students will learn knowledge about systematic position, structure, physiology and life cycles of microbes and their impact on humans and environment
		CO3	Students will get the knowledge of microscopy and microbial staining.
		CO4	Student will learn and understand identification and preservation of microbes
		CO5	They will understand about application and research of industries.
	Microbial diversity and Technology – (Practicals) 21BSC1BOT1P	CO1	Students will learn about appliances used for microbiological technique studies
		CO2	Student will learn microbial cell and their diseases
		CO3	Students will learn about of Rhizobium from root nodules, Bateria, fungi and mushroom cultivation
	OE : Plants and Human welfare 21BSC1BOT1	CO1	To make the students familiar with economic importance of diverse plants that offer resources to human life.
		CO2	To make the students known about the plants used as-food, medicinal value and also plant source of different economic value.
		CO3	To generate interest amongst the students on plants importance in day today life, ecosystem and sustainability
		CO4	They will learn about conservation of plants
		CO5	Students were learn plants sources and their uses
	B. SC. II SEM NEP	Diversity of non flowering plants (Theory) 21BSC2BOT2L	CO1
CO2			Students will learn knowledge about the morphology, anatomy, reproduction and life cycle across Algae, Bryophytes
CO3			Students will learn about the Pteridophytes and Gymnosperms,
CO4			Students will learn about the ecological and evolutionary significance
CO5			Students will learn about the Obtain laboratory skills.
Diversity of non flowering plants		CO1-	Students will learn about the classification, reproduction and lifecycle of Nostoc, Oscillatoria, Oedogonium & Spirogyra, Ectocarpus and


	(practical's) 21BSC2BOT2 P		Batrachospermum	
		CO2-	Students will learn about life-cycle of Riccia & Anthoceros, Funaria,	
		CO3-	Students will learn about life-cycle of Selaginella and Equisetum, of Pteris, Azolla, Psilotum.	
		CO4-	Students will get the anatomy and reproduction in Cycas, Pinus and Gnetum	
	OE : Biofuel 21BSC1BOT2	CO1	To make the students familiar with Bio-fuel plant species cultivation for Commercial exploitation.	
		CO2	To make the students known about the Bio-fuel used in automobile industries and solving fuel problems in future.	
		CO3	To generate interest amongst the students to know the importance of Bio-fuel in day today life and economic wellbeing.	
	B. SC. III SEM NEP	Plant Anatomy and Developmental Biology (Theory) 21BSC2BOT3 L	CO1	Observation of variations that exist in internal structure of various parts of a plant and as well as among different plant groups in support for the evolutionary concept.
			CO2	Skill development for the proper description of internal structure using botanical terms
			CO3	Induction of the enthusiasm on internal structure of locally available plants.
CO4			Understanding various levels of organization in a plant body with an outlook in the relationship between the structure and function through comparative studies.	
CO5			Observation and classification of the floral variations from the premises of college and house.	
Theory based Practical's on Plant Anatomy and Developmental Biology 21BSC2BOT3 P		CO1-	Students will learn about Double staining technique and will get the knowledge in tissue organization in root & stem.	
		CO2-	Students will learn about abnormal secondary growth in plants.	
		CO3-	Students get the knowledge of microsporogenesis & megasporogenesis, structure of pollen grains.	
		CO4-	Students will get the knowledge of primary internal structure of root, stem and mount the endosperm & embryo	
OE : Botanical garden and landscaping		CO1	Conceptualize flower arrangement and bio-aesthetic planning	
		CO2	Design various types of gardens according to the culture and art of bonsai	
		CO3	Distinguish between formal, informal and free style gardens	
		CO4	Establish and maintain special types of gardens for outdoor and indoor landscaping	
B. SC. IV		Ecology and Conservation	CO1	Ecological levels of organisation. Ecological factors:
			CO2	Altitude Ecological groups of plants and their

SEM NEP	Biology (Theory) 21BSC2BOT4 L		adaptations
		CO3	Concept development in conservation, global ecological crisis, Sustainable development and pros and cons of human intervention
		CO4	Laws and regulatory authorities and global issues related to climate change and sustainable development.
		CO5	Phytogeography and Environmental issues,
	Theory based Practical's on Ecology and Conservation Biology 21BSC2BOT4 P	CO1-	Determination of pH of different types of Soils, Estimation of salinity of soil/water samples
		CO2-	Ecological instruments – Wet and Dry thermometer, Altimeter, Hygrometer, Soil thermometer, Rain Gauge, Barometer,
		CO3-	Study of a pond/forest ecosystem, phytogeographical studies and recording the different biotic and abiotic components using remote sensing
	OE: Medicinal plants in health care 004 BOT 051	CO1	Apply the techniques of conservation and propagation of medicinal plants.
		CO2	Setup process of harvesting, drying and storage of medicinal herb.
		CO3	Propose new strategies to enhance growth of medicinal herbs considering
B. SC. V SEM NEP	Paper I: Plant Taxonomy & Resource Botany 21BSC5BOT 5L1	CO1	Understanding the main features in Angiosperm evolution
		CO2	Ability to identify, classify and describe a plant in scientific terms, thereby, Identification of plants using dichotomous keys. Skill development in identification and classification of flowering plants.
		CO3	Interpret the rules of ICN in botanical nomenclature.
		CO4	Classify Plant Systematic and recognize the importance of herbarium and Virtual Herbarium, Evaluate the Important herbaria and botanical gardens.
		CO5	Recognition of locally available angiosperm families and plants and economically important plants. Appreciation of human activities in conservation of useful plants from the past to the present.
	Theory based Practical's on Plant Taxonomy & Resource Botany 21BSC5BOT 5P1	CO1-	Study of root, stem and leaf structure and modifications.
		CO2-	Study of inflorescence types. Study of flower and fruits. Floral diagram and floral formula.
		CO3-	Study of families mentioned in theory with at least two examples for each family
	Paper II: Genetics and Plant Breeding (Theory) 21BSC5BOT 5L2	CO1	Understand the basics of genetics and plant breeding
		CO2	Ability to identify, calculate and describe crossing over, allelic generations and frequencies of recombination.
		CO3	Interpret the results of mating and pollinations.
		CO4	Classify plant pollination methods
		CO5	Recognition of modes of inheritance of traits/

B. SC. VI SEM NEP	Theory based Practical's on Genetics and Plant Breeding 21BSC5BOT 5P2		phenotypes and phenotype-genotype correlation.
		CO1	Reproductive biology, self and cross pollinated plants; vegetative propagation. Origin, distribution and centres of diversity of crop plants:
		CO2	Hybridization: Emasculation, bagging, pollination and production of hybrids and pollen fertility.
		CO3	Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square.
	Paper I: Cell Biology (Theory) 21BSC6BOT 6L1	CO1	Understanding of Cell metabolism, chemical composition, physiochemical and functional organization of organelle
		CO2	Contemporary approaches in modern cell and molecular biology.
		CO3	To study the organization of cell, cell organelles and biomolecules (i.e protein, carbohydrate, lipid and nucleic acid)
		CO4	To gain knowledge on the activities in which the diverse macro molecules and microscopic structures inhabiting the cellular world of life are engaged.
		CO5	To understand the various metabolic processes such as respiration, photosynthesis etc. which are important for life.
	Theory based Practical's on Paper I: Cell Biology, 21BSC6BOT 6P1	CO1-	Study of plant cell structure with the help of epidermal peel mount of Onion/ Rhoeo/ Crinum.
		CO2-	Study different stages of mitosis and meiosis (Onion/ Rhoeo/ Crinum)
		CO3-	Study of Karyotype using camera-lucida and Isolation of cell organelle – Chloroplast.
	Paper II: Plant Physiology and Biochemistry (Theory) 21BSC6BOT 6L2	CO1	Importance of water and the mechanism of transport.
		CO2	To understand biosynthesis and breakdown of biomolecules.
		CO3	Role of plant hormones in plant development and about secondary metabolites.
CO4		Preliminary understanding of the basic functions and metabolism in a plant body.	
CO5		To understand the importance of nutrients in plant metabolism and crop yield.	
Theory based Practical's on Plant Physiology and Biochemistry 21BSC6BOT 6P2	CO1-	To determine the osmotic pressure of the cell sap by plasmolytic method.	
	CO2-	Separation of photosynthetic pigments by paper chromatography and measure their Rf values.	
	CO3-	Estimation of TAN (Titratbale acid Number) from Bryophllum leaves /Aloe vera.	


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