



Mahatma Gandhi Vidyamandir's

**Loknete Vyankatrao Hiray Arts, Science and Commerce College,
Panchavati, Nashik-422003**

(Affiliated to SPPU, Pune, Reaccredited with 'A' grade, Recipient of Best College Award by SPPU)

**Programme Specific Outcomes,
&
Course Outcomes of B.SC**

Department of Botany

Academic Year

2021-22

Programme Specific Outcomes: B.Sc. Botany(USB)

Name of the Department : Botany	
Program Specific Outcomes	
At the end of the programme, student will be able to	
1	Analyse and present the research data using bioinformatics and biostatistics tools.
2	Apply knowledge for conservation of endemic and endangered plant species
3	Augment the recent developments in the field of Molecular and cell Biology, Biotechnology, Computational Botany and relevant fields of research and development.
4	Use creativity, critical thinking, analysis and research skills to solve biodiversity and environmental issues.
5	Students get conceptual knowledge of entrepreneurships in mushroom cultivation, Biofertilizers and Biopesticides production, plant tissue culture laboratories, Enzyme production, Fermentation, Single cell proteins etc.
6	Students will be well versed with various mechanisms of GMOs and molecular techniques.

Course Outcomes: B.Sc. Botany(USB)

Class : F.Y.B.Sc		
Semester-I		
Paper	Course code & course title	At the end of the course, student will be able to
I	USB(BO 111) Plant Life and Utilization-I	Outline cryptogams and phanerogams.
		Define general characters of cryptogams and Phanerogams.
		Classify the members of plants groups in to cryptogams and Phanerogams.
		Describe the Life cycle of plant forms of cryptogams and Phanerogams.
		Compare and describe the salient features of Cryptogams.
		Summarize type of diversity compare, organize and structure ecological grouping
II	USB (BO 112) Plant Morphology and Anatomy	Define plant morphology and anatomy
		Discuss morphology of vegetative and reproductive parts of plants.
		Describe anatomy of Monocot and dicot plants.
		Explain types of plant tissues.
		Understand and describe reproductive parts of the Angiospermic plants
		Formulate and compose of floral formula and floral diagram
III	USB (BO 113) Practical Botany –I	Recognize the live forms of Cryptogamic and Phanerogamic plants.
		Analyse and describe botanical concepts, including plant anatomy.
		Illustrate the floral parts, fruits, leaves and their types.
		Categorize the plants into Monocot and Dicot on the basis of anatomical characters.
		Field survey for identification of angiospermic plants
		Tree plantation
Semester-II		
I	USB (BO 121) Plants life and Utilization II	Understand about the diversity, systemic and economic importance of higher plants
		Explain identify and classify the higher plants
		Know the Economic Importance of higher plants
		Compares the features of higher plants.
		Aware the status of Phanerogams as a group in plant kingdom.
		Apply the economic and ecological importance of flowering plants
		Define and describe plant physiology

II	USB (BO 122) Principles of plants Science	Explain and recognise physiological phenomenon in plants
		Describe the mechanism of physiological phenomenon
		Distinguish and differentiate cell structures of Types of cells
		Understand ultrastructure and functions of cell organelles, different biomolecules in cells
		Distinguish, compare cell cycle in plant
III	USB (BO 123) Practical based on BO121 and Bo 122	Describe morphological, reproductive characters, taxonomy of higher plants.
		Discuss and compare internal organization of plants
		Understand categories and explain utilization of higher plant
		Preparation and utilizations of different stains, medium etc.
		Estimation of different biomolecules
		Aware about conservation and sustainable use of plants

Class : S.Y.B.Sc.		
Semester-III		
Paper	Course code & course title	At the end of the course, student will be able to
I	USB (BO 231) Taxonomy of Angiosperm and Plant Ecology	Taxonomy of Angiosperm and Plant Ecology
		Define different terminology of taxonomy
		Discuss and explain about the systematic position of Angiosperm
		Understand, summarize about plant nomenclature
		Compose, formulate the floral variations in angiosperm families, their phylogeny and evolution.
		Define, recognize and describe scope of Ecology
II	USB (BO 232) Plant Physiology	Understand the various physiological life processes in plants
		Summarize, describe and distinguish of mechanisms of physiological phenomenon in plants
		Demonstration, examine and classify about various mechanisms of growth, development and functioning of plants
		Differentiate abiotic and biotics factors affecting on functioning of plants
		Discuss, describe and differentiate process of flowering in plants
		Demonstrate, examine and describe process of seed germination
III	USB (BO 233)	Memorize, recognize and explain different plant terminology
		Demonstrate and distinguish and Categorize different plant families
		Compare and differentiate different Ecological grouping of plants

	Practical based on Bo231 and Bo 232	Sampling, testing and structuring of vegetation different group
		Experimenting of growth, development and reproduction in plants as well as understand the physiological changes with the environmental impact.
		Demonstrated different experiment of plant physiology and Ecology
Semester-IV		
I	USB (BO241) Plants Anatomy and Embryology	Define and explain different terminology of plants anatomy and Embryology
		Discuss and describe the scope & importance of Anatomy and Embryology
		Recognize, compare, describe and classify different tissues systems in internal organization of plants
		Compare and classify internal organization of plant organs
		Demonstrate, explain, classify and describe the structure and development in plant embryology
		Distinguish, compare and explain process of post fertilization embryogeny
II	USB (BO 242) Plant Biotechnology	Describe, clarify and Summaries Concepts, tools and techniques related to tissue culture
		Demonstrate the different methods used for genetic transformation of plants
		Explain the basic principles and modern age applications of recombinant DNA technology.
		Judge, evaluate and summarize bioinformatics to prepare database
		Demonstrate and application phytoremediation techniques
		Discuss and distinguish biofuel technology and role of plants as source of biofuels
III	USB (BO243) Practical based on BO241 and Bo 242	Classify, distinguish and categories different tissues systems in plants
		Demonstrate of biotechnology techniques and anatomy
		Examine and experiment related to biotechnology
		Experiment/ demonstrate/ design to different techniques in biotechnology
		Discuss, describe and differentiate in embrogeny
		Experiment/ demonstrate/ design to different techniques in biotechnology

Class :T.Y.B.Sc

Semester V

Paper	Course code & course title	At the end of the course, student will be able to
I	USB (BO351)	Define and Describe Lower Cryptogams.

	Algae and Fungi	Classify various system of Lower Cryptogams
		Demonstrate and explain the Life cycle of Lower Cryptogams
		Distinguish And compare Habit and Habitat of Lower Cryptogams
		Judge and evaluate General characters of Lower Plants
		Summaries the Life cycle of Lower Plants.
II	USB (BO352) Archegoniate	Describe Archegoniate
		Compare and classify Archegoniate
		Demonstrate and explain the Life cycle of Archegoniate
		Compare Habit and Habitat of Archegoniate
		Judge and evaluate General characters of Archegoniate
		Summaries the Life cycle of Archegoniate.
III	USB (BO 353) (Spermatophyte and Palaeobotany)	Define and Describe Angiosperms
		Explain the Pseudanthial theory and Transitional-Combinational theory
		Classify Cronquist's system And APG IV System
		Compare Habit and Habitat of Angiosperms and Gymnosperms
		Evaluate General characters of Angiosperms and Gymnosperms
		Summaries the Life cycle of Pinus and Gnetum.
IV	USB (BO 354) Plant Ecology	Define Plant Ecology
		Discuss Interrelationship between Living world
		Classify Ecology
		Distinguish between Ecology branches
		Evaluate and Summarize Ecological Impact Assessment
		Value of Environmental Audit.
V	USB(BO 355) Cell and Molecular Biology	Define and Explain concepts and terminology
		Recognise and Discuss cell Organelles
		Classify, differentiate and biogenesis of cell organelles
		Discussed and examine cell signalling and replication
		Summarize Molecular Biology and gene expression
		Experiment of Griffith's and Avery
VI	USB (BO 356) Genetics	Define and Explain and terminology of Genetics
		Describe and summarised gene interaction

		Compare and discuss linkage and recombination
		Explain and compare the mutation and its types
		Discuss and analysis of inheritance
		Interrelationship to chromosomal behaviour pattern with different mendelian inheritance
I.	USB (BO 357) Practical based on BO – 351 and BO-352	Classify, distinguish and categories different Algae
		Classify, distinguish and categories different Fungi
		Demonstrate and Classify of Bryophytes
		Discuss, describe and differentiate Morphological Character of Bryophytes.
		Demonstrate and Classify of Pteridophytes
		Discuss, describe and differentiate Morphological Character of Pteridophytes
II.	USB (BO 358) Practical based on BO – 353 and BO-354	Classify, distinguish and categories different Family
		Distinguish ,compare and describe Vegetative and Reproductive Character.
		Experiment and demonstrate internal and external morphology in Pteridophytes and Gymnosperm
		Demonstrate / Design Fossils
		Experiment / Test on Polluted water
		Discuss of Ecosystem
III.	USB (BO 359) Practical based on BO – 355 and BO-356	Demonstrate / Design Cytological Techniques
		Distinguish, compare, and describe Mitosis and Meiosis
		Experiment/ Demonstrate Mitosis
		Discuss/Demonstrate RNA and DNA
		Experiment / Demonstrate Onion roots cell
		Memorize, recognize and explain of Multiple Alleles(Blood Group in Human)
I	USB (BO 3510) Medicinal Botany	Explain, define terminology the scope of Medicinal plants
		Describe and summarize various system of medicine
		Discuss and explain different technique of conservation
		Differentiate and distinguish of propagation of medicinal plants
		Evaluate the application of ethnobotany and folk medicine

		Create formula of ethnobotany or folk medicine
II	USB (BO 3511) Plant Diversity and Human Health	Describe the different terminology of plant diversity and conservation
		Discuss the types and value of Plants diversity
		Explain ethical, aesthetic values of biodiversity
		Examine and classify management of plant diversity
		Distinguish and evaluate conservation of biodiversity
		Summarize the role of plant human welfare
Semester VI		
I	USB (BO 361) Plant Physiology and Metabolism	Compare and classify of mineral elements and essential elements
		Explain Photosynthetic mechanism and distinguish between light reaction and dark reaction
		Discuss and summarize the physiological process
		Mechanism of stomata opening and closing at depend upon the light
		Examine vascular tissue
		Differentiated and compare plant growth hormones Discuss in photomorphogenesis to defend on red and far red light
II	USB (BO 362) Biochemistry	Describe and Define Biochemistry
		Discuss and Describe Biomolecules
		Classify and Relate Amino acid and Proteins Structure
		Write Enzymes Properties
		Categorise Vitamins
		Compare Carbohydrates and Lipids
III	USB (BO 363) Plant Pathology	Describe and define terminology of Plant Pathology
		Discuss and describe the of mechanism Plant Disease
		Evaluate and identified the Disease of Plant
		Compare of Viral and Non-Parasitic Disease
		Distinguish Fungal and Bacterial Plant Disease
		Use of Chemical control to plant Disease
IV	USB (BO364)	Define and describe terminology of Evolution
		Discuss mechanism of Organic Evolution
		Differentiate Lamark's and Darwinism theory

	(Evolution and population genetics)	Summarise Population
		Support Speciation types in isolating Mechanism
		Evaluate Geological Time Scale based on fossils
V	USB (BO 365) Advanced plant biotechnology	Define and Describe Biotechnological terminology
		Discuss Plant Tissue culture techniques
		Demonstrate and perform Experiment of Tissue Culture
		Differentiate Direct and Indirect gene transfer
		Summarise importance, application of biotechnology
		Distinguish Microbial technology and Nano Biotechnology
VI	USB (BO 366) Plant breeding and Seed technology	Define and Describe Plant breeding terminology
		Discuss the Types and techniques of Plant Breeding
		Evaluation and Importance, scope of Plant Breeding
		Summarise Seed Technology techniques
		Application and evaluated seed testing methods
		Generation the application of Seed Production
I	USB (BO367) Practical based on BO – 361 and BO-362	Experiment / Demonstrate of osmotic potential of plant cell by plasmolysis method
		Describe and Discuss of photosynthesis mechanism
		Experiment / Estimate of Amino acid by paper chromatography method
		Estimation /Test of Proteins
		Demonstration/Examine of enzyme activity
		Select Different qualitative test use of biomolecules(Starch, Lipids and Proteins)
II	USB (BO368) (Practical based on BO – 363 and BO-364)	Demonstrate/Recognise Plant Pathogens
		Discuss /Describe of various Culture method
		Demonstrate and Classify of Fungal Disease
		Distinguish / Differentiate Viral and Non-Parasite Disease
		Describe/Discuss of Geological time Scale
		Demonstrate and Collect Fossil Plant
III	USB (BO 369)	Experiment / Demonstrate Preparation of different techniques

	(Practical based on BO – 365 and BO-366)	Recognise and Predict of Secondary Metabolites in plant
		Demonstration and perform and handling of equipment used in genetic engineering
		Demonstration ,estimate and measure to Fermentation technology
		Demonstration of Hybridisation Techniques
		Estimate test seed moisture ,seed germination, seed diseases etc
I	USB (BO3610) Nursery and gardening management	Describe and define terminology of nursery management and gardening
		Discuss and classify structure and types of seeds
		Demonstration and explain different methods of propagation and gardening
		Distinguish techniques of management
		Judge and design of gardening
		Develop design of gardening, landscaping
II	USB (BO 3611) Biofertilizer	Define and describe the terminology of biofertilizer production
		Describe techniques of biofertilizer productions
		Demonstration and discuss biofertilizer production
		Classify and categorise various organism biofertilizer production
		Distinguish and estimate effect of biofertilizer on crop
		Design model of biofertilizer production