PG AND RESEARCH DEPARTMENT OF BOTANY

Programme : B.Sc., Botany

PO No.	Programme Outcomes Upon completion of the B.Sc. Degree Programme the graduate will be able to
PO-1	Emerge with competency in the subject of Botany and apply knowledge to cater to the needs of Society / Employer / Institution / Own Business Enterprise
PO-2	Imbibe analytical / critical / logical / innovative thinking skills in the field of Bioinformatics, Molecular biology, Taxonomy, Biotechnology, Tissue Culture, Pharmacognosy, Commercial Plant Propagation Techniques
PO-3	Acquire distinct traits and ethics with high professionalism to gain a broader insight into the domain concerned for nation building
PO-4	Focus on theoretical and practical knowledge of traditional and emerging topics and advanced tools and techniques of research with understanding of plant science in a holistic perspective
PO-5	Develop the importance and scope of the discipline and create a scientific attitude to make students open-minded, critical and curious and make them to share knowledge of creating awareness about diversity of plants, environmental issues, health and safety to the society

PSO No.	Programme Specific Outcomes Upon completion of these courses the student would
PSO-1	Understand and appreciating plant diversity and inculcating strong fundamentals on modern and classical aspects of Botany
PSO-2	Imbibe analytical, critical and innovative thinking skills in the fields of Bioinformatics, Molecular Biology, Taxonomy, Microbiology, Biotechnology, Tissue Culture and Horticulture
PSO-3	Focus on theoretical and practical knowledge of traditional and emerging areas of knowledge in Plant Science in a holistic perspective
PSO-4	Organize and deliver relevant applications of knowledge through effective written, verbal and virtual communication and interact efficiently with people from diverse backgrounds
PSO-5	Exchange social and environmental consciousness with their fellow citizens and acquire distinct traits and ethics with high professionalism to gain a broader insight into the domain concerned for nation building

Course Title	PLANT DIVERSITY –I (ALGAE, FUNGI, LICHENS, BACTERIA, VIRUS AND PLANT PATHOLOGY)	
CODE	**23BOUC202**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Demonstrate the various trends for classification of Algae, Fungi and lichens and to relate the different classification systems to gainknowledge on the lower plants in plant kingdom	K1, K2
CO-2	Compare and contrast the characteristics of lower group of plants and compare the diversity with other forms of plant kingdom	K2, K3
CO-3	Provide a framework approaches in plant disease management thatcan be used for their profession	K2, K3
CO-4	Familiarize with basic information in Botany with special attentionto the economic importance of lower group of plants	K2,K3
CO-5	Analyze the skills in culturing microorganisms and identify thefuture use in industries	K3
Course Title	**PLANTDIVERSITY–II(BRYOPHYTES,PTERIDOPHYTES,GYMNOSPERMS AND PALAEOBOTANY)**	
CODE	**23BOUC202**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Distinguish the classification of Bryophytes, Pteridophytes and Gymnosperms in plant kingdom and relate their characteristic features	K1, K2
CO-2	Understand the phylogenetic evidence between the fossils and the living plants	K2,K3
CO-3	Recall the biological facts, concepts and principles and appreciating significance of plant kingdom	K1,K2
CO-4	Familiarize with basic information in Bryophytes, Pteridophytes and Gymnosperms with special attention to the economic importance of plants to society	K2,K3
CO-5	Develop the ability for the application of acquired knowledge in various fields of plant sciences	K2 ,K3

Course Title	CORE PRACTICAL - I (ALGAE,FUNGI, LICHENS, BACTERIA,VIRUS, PLANT PATHOLOGY,BRYOPHYTES,PTERIDOPHYTES,GYMNOSPERMSANDPALAEOBOTANY)	
CODE	23BOUCP01	
CO No.	Course Outcomes	Knowledge Level
CO-1	Develop skill in sectioning staining and mounting, instrumentation techniques along with collection and interpretation of biologicalmaterials	K1,K2,K3
CO-2	Acquire knowledge on various forms of lower plants	K2,K3
CO-3	Diagnose the structural features of plant organs and differentiate microscopically their tissue elements	K2, K3
CO-4	Analyze the age and scientific perspective of most important fossils	K2, K3
CO-5	Think critically, design and execute an experiment which will serveas a practical basis for a career in research	K2
Course Title	ALLIEDBOTANY-PAPER-I	
CODE	23BOUA101	
CONo.	Course Outcomes	Knowledge Level
CO-1	Acquire knowledge to describe the structure, reproduction and life cycle of diverse forms of plants	K1,K2
CO-2	Compare and contrast the distinguishing characters of Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms	K1,K2, K3
CO-3	Understand the systematic position and economic importance of plants	K1,K2
CO-4	Familiarize the taxonomic characters to identify theunknown plant species	K2, K3
CO-5	Apply the skill and techniques to produce algal, fungal and bacterial biomass	K2, K3
Course Title	ALLIEDBOTANY-PAPER-II	
CODE	23BOUA202	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the Structure and functions of ecosystems and adaptations of plants	K1,K2

CO-2	Acquire knowledge on tissues and histological structures of plants	K1,K2
CO-3	Recall the physiological functions of plants	K1,K2
CO-4	Analyse and apply the skill of commercial horticultural techniques	K3
CO-5	Gain knowledge on identification of medicinal plants and apply the skill to cultivate and marketing of commercial plants	K3
Course Title	**ALLIED BOTANY PRACTICAL**	
CODE	**23BOUAP01**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Obtain facts to illustrate the morphology, anatomy and physiologyof various forms of plants	K1,K2,K3
CO-2	Evaluate the different characters of plants in different environment	K2, K3
CO-3	Identify the diverse of plants using histological structures of plants	K2
CO-4	Develop and apply the skills of horticultural techniques on cropplants	K3
CO-5	Apply the skill and techniques to produce economically importantbio-products	K3

Course Title	**ANATOMYAND EMBRYOLOGY**	
CODE	**23BOUC303**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Gain knowledge of anatomical features of plant cells, tissues, organs and their function	K1
CO-2	Interpret the basic pattern of plant growth and analyse the relationships between primary and secondary growth	K2 , K3
CO-3	Develop skills in sectioning, staining of fresh plant materials	K2 , K3

CO-4	Analyse the structure and development of gametes, fertilization and embryo development	K2
CO-5	Develop the ability for the application of acquired knowledge in histochemistry for the identification of different tissues	K3, K4
Course Title	**CELLBIOLOGYAND TISSUECULTURE**	
CODE	**23BOUC404**	
CONo.	**Course Outcomes**	**Knowledge Level**
CO-1	Describe the structures and functions of cell organelles	K1, K2
CO-2	Understand the mechanism of DNA replication and proteinsynthesis	K2
CO-3	Analyse the various factors determining the hereditary from onegeneration to another	K1, K2
CO-4	Acquire combined knowledge and perform research work onmolecular and cellular biology	K3, K4
CO-5	Ability to gain knowledge in tissue culture techniques and applythe skill to develop rare, biologically important plants	K3, K4

Course Title	**TAXONOMYOFANGIOSPERMSANDECONOMICBOTANY**	
CODE	**21BOUC505**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Acquire thorough knowledge of the descriptive terms used intaxonomy and its classification	K1
CO-2	Know about herbarium techniques, nomenclature, typification,author citation and modern trends in taxonomy	K2,K3

CO-3	Characterize the diagnostic features, pollination mechanism andeconomic importance of families in Polypetalae	K2,K3
CO-4	Characterize the diagnostic features, pollination mechanism andeconomic importance of families in Gamopetalae	K2,K3
CO-5	Characterize the diagnostic features, pollination mechanism and economic importance of families in Monochlamydeae and Monocotyledons	K2,K3
Course Title	**ANATOMY AND EMBRYOLOGY AND CELL BIOLOGY AND TISSUECULTURE**	
CODE	**23BOUCP02**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Acquire knowledge of plant cells, tissues and histological structures and develop skills in sectioning and staining	K1
CO-2	Analyse the structure and development of monocot, dicot embryos and pollen grains	K2,K3
CO-3	Analyse the structure of plant cell organelles and their functions	K2, K3
CO-4	Familiarize the basics of cell division in plants	K1
CO-5	Acquire knowledge of the techniques of plant tissue culture andsterilization techniques and apply the skill in the laboratory	K2, K3
Course Title	**PLANTPHYSIOLOGY**	
CODE	21BOUC506	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Acquire basic knowledge about various plant water relations	K1
CO-2	Gain knowledge on physiological processes between plants and their environment	K1,K2
CO-3	Understand and analyse the metabolic and physiological process unique to plants	K2, K3
CO-4	Comprehend the mechanisms of respiration in plants	K2,K3
CO-5	Understand the role of phytohormones, physiology of flowering and seed dormancy	K2,K3

Course Title	PHYTOCHEMISTRY	
CODE	21BOUC507	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the structure of atoms, bonding of organic compounds and the role of pH and buffer action in plants	K1
CO-2	Gain knowledge on structure and classification of phytoconstituents	K2,K3
CO-3	Understand the role of biocatalysts and the process of nitrogen metabolism in plants	K2, K3
CO-4	Acquire knowledge on the classification, biosynthesis and applications of secondary metabolites	K2,K3
CO-5	Comprehend the principles and working mechanism of instruments	K2,K3
Course Title	Elective– I:APPLIED MICROBIOLOGY	
CODE	21BOUE511	
CO No.	Course Outcomes	Knowledge Level
CO-1	Develop the knowledge on different microbial flora of soil and air and also study their relationship with environment	K1, K2
CO-2	Gain knowledge about microorganisms of water and their role in sewage treatment in combating the organic pollutants and organicdecomposting	K1,K2
CO-3	Get acquainted with various basic skills on sterilization and fermentation techniques	K2, K3
CO-4	Enumerate microorganisms from various food samples and understand the microbiology of processed foods	K2, K3
CO-5	Attain a detailed knowledge on the role of microbes in the production of alcohol, antibiotics, vitamins and organic acids	K2, K3

Course Title	Elective-II HORTICULTUREANDPLANTBREEDING	
CODE	21BOUE512	
CO No.	Course Outcomes	Knowledge Level
CO-1	Acquire basic knowledge in nursery structures and propagation techniques	K1, K3
CO-2	Know about garden types and garden implements	K2, K3

CO-3	Be acquainted with the cultivation and preservation techniques of vegetables and fruits	K1, K2
CO-4	Gain knowledge on commercial floriculture and develop self-entrepreneurial skills	K2, K3
CO-5	Provide insight into the science of plant breeding	KI,K3
Course Title	**ECOLOGYAND PHYTOGEOGRAPHY**	
CODE	**21BOUC608**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Become familiar with the interaction of organisms with both the physical and biological environment	K1
CO-2	Develop an understanding of the differences in the structure and function of different types of ecosystems	K1,K2
CO-3	Acquire knowledge about structural modifications of plants and plant succession	K2,K3
CO-4	Analyze the evolutionary ecology, natural selection and the distribution pattern of vegetation in the world	K2,K3
CO-5	Understand and analyze the phytogeographical divisions and climate of India	K2,K3

Course Title	**GENETICSAND BIOSTATISTICS**	
CODE	**21BOUC609**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Recall and understand the basic concepts of genetics through Mendelism	K1,K2
CO-2	Understand and relate the quantification of heritable traits and sex determination in plants	K1,K2
CO-3	Understand the genetic mechanism and provide insight into cellular and molecular genetics	K2,K3
CO-4	Comprehend the role of mutation, mutagens and analyze gene regulation in plants	K2,K3
CO-5	Acquire knowledge on the biostatistical aspects pertaining to biological studies and their applications	K2,K3
Course Title	**BIOTECHNOLOGYI-CONCEPTSANDTECHNIQUES**	
CODE	**21BOUC610**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Obtain knowledge on the concepts and commercial potential of biotechnology	K1, K2
CO-2	Understand the concept of gene cloning and application of genetic engineering	K1, K2

CO-3	Acquire knowledge in gene transfer methods in plants	K2, K3
CO-4	Learn the techniques of segregation of genetic materials	K2,K3
CO-5	Infer and appraise microbial enzymes and their potential benefits	K2,K3

Course Title	**BIOTECHNOLOGYII–APPLIEDBIOTECHNOLOGY**	
CODE	**21BOUC611**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Gain knowledge on application of genetic engineering in agriculture and medicine	K1,K2
CO-2	Understand the role of biotechnology in relation to food technology and acquire the skill to gain employment in food industry	K1,K2
CO-3	Analyze the importance of biotechnological procedures in pollution control in order to build a safe environment	K2,K3
CO-4	Be familiar with the role of microorganism as biofertilizers in agriculture	K2,K3
CO-5	Gain knowledge on the energy production potentials of microbes and plants for human benefit	K2,K3
Course Title	**FUNDAMENTALSOFCOMPUTERAND BIOINFORMATICS**	
CODE	**21BOUE613**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Enhance fundamental knowledge about the components of computer and its usage	K1, K2
CO-2	Relate and develop skills to create documents, tables, spread sheets graphical images and PowerPoint presentations	K1, K2
CO-3	Build knowledge on internet, e-mail, Google forms and overview of IoT and its applications	K2, K3
CO-4	Acquire combined knowledge of biological databases	K2, K3
CO-5	Be acquainted with sequence analysis, biomolecular visualization and Drug designing	K2,K3

Course Title	CORE PRACTICALS- III TAXONOMYOFANGIOSPERMS&ECONOMICBOTANY,ECOLOGY& PHYTOGEOGRAPHY AND GENETICS & BIOSTATISTICS	
CODE	21BOUCP03	
CO No.	Course Outcomes	Knowledge Level
CO-1	Identify, collect and preserve the plants belonging to major angiosperm families by observing their diagnostic features and understand their economic importance	K1, K2
CO-2	Understand the structure of the ecosystem and adaptations of plants to varying habitats in the biosphere	K1,K2
CO-3	Undertake field based studies to study vegetation using Quadrat and transect methods	K2, K3
CO-4	Analyse the soil quality and identify the major Phytogeographical regions of India	K1,K3
CO-5	Solve problems on Mendelian inheritance and interaction of genes and to apply the statistical methods for analyzing data	K2, K3
Course Title	CORE PRACTICALS- IV PLANTPHYSIOLOGY, PHYTOCHEMISTRY, BIOTECHNOLOGYI&II (CONCEPTS AND TECHNIQUES, APPLIED BIOTECHNOLOGY) AND FUNDAMENTALS OF COMPUTER & BIOINFORMATICS	
CODE	21BOUCP04	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the mechanism of various metabolic processes in plant cells and gain knowledge in the field of plant physiology.	K1,K2
CO-2	Gather knowledge about isolation, identification and quantification of active phytoconstituents through various chromatographic techniques	K2, K3
CO-3	Comprehend the tools of biotechnology and genetic engineering	K2,K3
CO-4	Gain knowledge about the role of biofertilizers in agriculture and plants as energy source	K2,K3
CO-5	Learn about the biotechnological procedures in pollution control to build a safe environment	K2,K3

Course Title	APPLIEDMICROBIOLOGYANDHORTICULTURE&PLANTBREEDING	
CODE	21BOUEP01	
CO No.	Course Outcomes	Knowledge Level
CO-1	Acquire in depth practical knowledge on microbial culture techniques and identifications of microorganisms	K2,K3
CO-2	Test the purity of food samples and analyze the microbial flora of soil	K2,K3

CO-3	Acquire hands-on training in plant propagation techniques and flower arrangements	K2,K3
CO-4	Attain knowledge on garden tools, fertilizers and types of garden	K2, K3
CO-5	Perform the basic procedures in breeding plants using conventional method	K2