

PG AND RESEARCH DEPARTMENT OF BOTANY

Programme: M.Sc., Botany

PO No.	Programme Outcomes Upon completion of the M.Sc. Degree Programme, the graduate will be able to
PO-1	Focus perceptive in the subject of Botany and apply its principles and applications to become researchers / professionals / entrepreneurs
PO-2	Acquire contextual knowledge on basics and modern concepts, principles of various plant science phenomena and skills in handling scientific instruments in current areas with contemporary technologies and multidisciplinary settings
PO-3	Develop their abilities and efforts to generate ideas in research, concepts and knowledge for rewarding future career and educational goals

PSO No.	Programme Specific Outcomes Upon completion of these courses the student would
PSO-1	provide knowledge through various plant groups from primitive to highly evolved and to analyze the plant structures and function, plant evolutionary histories, diversity of plant kingdom and its conservation through laboratory skills as well as field studies
PSO-2	understand the applied sciences like Biotechnology, Agriculture, Horticulture, Forestry, Pharmacognosy, Pharmacology, Molecular Biology and Bioinformatics through the knowledge of plant science
PSO-3	encourage the research and internship opportunities through plant sciences with interdisciplinary perception and shaping a successful career

Course Title	PHYCOLOGY, BRYOLOGY AND LICHENOLOGY	
CODE	24BOPC101	
CO No.	Course Outcomes	Knowledge Level
CO-1	Evoke the information about various plant groups from primitive to highly evolved forms	K1,K2
CO-2	Acquire the knowledge of morphology and lifecycle of lower plants and update with affinities and evolutionary relationships to higher plants	K2,K3
CO-3	Analyse the knowledge and role of Algae, Bryophytes and Lichens in the environmental protection	K3, K4
CO-4	Develop inter-disciplinary research and to apply entrepreneurial skills in the commercial values of Algae and Lichens	K3
CO-5	Interpret the novel ideas and use of plant resources for food and medicine and support knowledge of algae production to the Local farmers community	K5

Course Title	MYCOLOGY AND PHYTOPATHOLOGY	
CODE	24BOPC102	
CO No.	Course Outcomes	Knowledge Level
CO-1	Analyse the classification, physiology, ecology, pathogenesis, nutrition, reproduction and life cycle patterns and evolution Within fungal biodiversity	K3, K4
CO-2	Analyze phylogeny and Interrelationships of Fungi and plant–pathogen interaction	K3, K4
CO-3	Interpret the interaction between the causal agent and the diseased plants in relation to environmental conditions	K3
CO-4	Apply the economic importance of Fungi for sustainable global development	K4
CO-5	Evaluate Fungi for making renewable substitutes for products to valuable food and feed ingredients and production of new Biological drugs	K5

Course Title	PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY	
CODE	24BOPC103	
CO No.	Course Outcomes	Knowledge Level
CO-1	Classify the Pteridophytes and understand the concepts of apospory and apogamy	K2
CO-2	Know about the Structure and Reproduction of some important Pteridophytic forms	K3
CO-3	Classify the Gymnosperms and know about important some important Gymnosperm species	K4
CO-4	Gain knowledge on the Angiospermic Characters of Gnetales	K3
CO-5	Learn the about the extinct Pteridophytic and Gymnosperm species	K4

Course Title	ANATOMY AND EMBRYOLOGY	
CODE	24BOPC104	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the hierarchy of plant structure by learning the basic features of plant cells, tissues, and organs and function of various tissues and exposure to evolutionary interpretations of anatomical homology	K2,K3
CO-2	Interpret the basic pattern of plant growth from different kinds of meristems and analyse the relationships between primary growth and secondary growth of naturally occurring plant assemblages and compare structural differences among different taxa	K2,K3,K4
CO-3	Distinguish connections between plant anatomy and the other major disciplines of biology, including taxonomy, cell biology, physiology, genetics, biochemistry, and ecology and make sense in light of evolution	K4
CO-4	Attain knowledge and assess formation of developmental cycles, regulation of the flowering process and embryo formation	K5
CO-5	Apply technical knowledge in the production of Parthenocarpic frutis	K3

Course Title	CELL BIOLOGY AND PLANT TISSUE CULTURE	
CODE	24BOPC205	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand and manipulate the structures and function of basic Components of eukaryotic cells, especially macromolecules, membranes and organelles	K2, K3
CO-2	Infer the cellular components underlying mitotic cell division	K4
CO-3	Describe the structure, composition and role of DNA and RNA and evaluate role of fundamental processes of replication and repair mechanism	K2, K5
CO-4	Analyse the tasks relevant to cell culture (preparation of media, inoculation, recovery, and assessment of cell growth)	K4
CO-5	Acquire and focus the skills in tissue culture with requirements for different plants and recognize troubleshoot problems during culture	K4

Course Title	GENETICS,GERMPLASM CONSERVATION AND PLANT BREEDING	
CODE	24BOPC206	
CO No.	Course Outcomes	Knowledge Level
CO-1	Explain and compare the interaction of genes, sex linked inheritance and sex determination	K2 , K4
CO-2	Recall and interpret the modern concept of genes, gene frequency and genetic drift	K3
CO-3	Conclude the regulation of gene expression in prokaryotes, eukaryotes and synthesis of genes	K5
CO-4	Analyse the strategies and methods in germplasm conservation	K4
CO-5	Apply the breeding methods and techniques in crop plants to promote entrepreneurial skills	K3

Course Title	MICROBES AND INDUSTRY	
CODE	24BOPE211	
CO No.	Course Outcomes	Knowledge Level
CO1	Understand the structure and characteristics of microbes and analyse culture methods and measurement of bacteria	K2, K4
CO2	Acquire knowledge on the structure and reproduction of plant virus, Bacteriophage and Mycoplasmas	K2, K4
CO3	Develop skills on fermentation and improvement of Microbial Strain	K5
CO4	Acquire knowledge about industrial manufacture of microbial products	K3
CO5	Get acquainted with the role of microbes in the production of Plant Growth Hormones, alcoholic beverages and Bio-fuels	K5

Course Title	PRACTICAL I : PHYCOLOGY, BRYOLOGY AND LICHENOLOGY, MYCOLOGY AND PHYTOPATHOLOGY AND CELL BIOLOGY AND TISSUE CULTURE	
CODE	24BOPCP01	
CO No.	Course Outcomes	Knowledge Level
CO1	Acquire analytical skills to attain significant mile stone in the field of Algae; Bryophytes and Lichens	K2
CO2	Apply and interpret with curiosity and creativity on Lower plants using histological studies	K4
CO3	Recall certain morphological attributes of diverse forms of plants and pathological processes that are distinct in plants	K2
CO4	Understand to select , apply and adopt appropriate techniques in the production of industrially useful Fungi	K2 , K3
CO5	Develop and apply the skills of <i>in-vitro</i> regeneration technique on plants	K3, K4

Course Title	PRACTICAL - II : PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY , ANATOMY AND EMBRYOLOGY AND GENETICS, GERMPLASM CONSERVATION AND PLANT BREEDING	
CODE	24BOPCP02	
CO No.	Course Outcomes	Knowledge Level
CO1	Acquire knowledge on embryological development and interaction of genes to predict morphological features	K2
CO2	Understand and evaluate the phylogenetic relationships between the fossils and present day plants	K2,K3
CO3	Use appropriate knowledge and develop skills to identify plants using salient features and anatomical variations	K3
CO4	Analyse and apply the skills in the conservation of plant diversity	K3

CO5	Apply the breeding methods and techniques to cultivate crop plants	K3
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Course Title	TAXONOMY AND BIOSYSTEMATICS	
CODE	23BOPC307	
CO No.	Course Outcomes	Knowledge Level
CO-1	Describe and classify plant diversity and understand the major features and evolutionary origins of vascular plants.	K1,K2
CO-2	Learn the terminologies of plant description and identify the plants using dichotomous keys	K3
CO-3	Be aware of the importance of taxonomic relationships in plant systematics and understanding its concept	K3, K4
CO-4	Recognize some important angiosperm families and gain knowledge of their diagnostic characters	K3
CO-5	Understand the systematics, diagnostic characters and economic values	K3

Course Title	PLANT PHYSIOLOGY AND PHYTOCHEMISTRY	
CODE	23BOPC308	
CO No.	Course Outcomes	Knowledge Level
CO-1	Acquire knowledge on physiological processes between plants and their environment	K1
CO-2	Understand and analyse the metabolic and physiological process unique to plants	K2,K3
CO-3	Understand physiological mechanisms of plants and to apply for crop improvement	K3, K4
CO-4	Develop entrepreneurial skills in using the hormones on plant propagation	K4
CO-5	Understand the functions of molecules and metabolites which serves as the foundation for advances in agriculture, horticulture and forestry	K3

Course Title	BIOINFORMATICS	
CODE	23BOPC309	
CO No.	Course Outcomes	Knowledge Level
CO-1	Acquire knowledge on different computational tools to find DNA sequences and to predict genes	K1,K2
CO-2	Understand the genetic composition of organisms	K2,K3
CO-3	Use appropriate knowledge and recognize problem-solving skill to develop new algorithms	K3,K4
CO-4	Analyse biological data using a variety of bioinformatics tools accessible on the network	K3
CO-5	Apply different approaches and tools for visualizing biomolecular structures	K4
Course Title	GENETIC ENGINEERING AND BIOTECHNOLOGY	
CODE	23BOPC410	
CO No.	Course Outcomes	Knowledge Level
CO-1	Acquire knowledge on the molecular tools of gene cloning technique	K1,K2
CO-2	Understand and analyse the transgenic plants and to apply the technique in crop improvement	K2,K3
CO-3	Know about molecular markers and its applications	K3, K4
CO-4	Develop entrepreneurial skill in biomining and Protect environment	K4
CO-5	Apply nano particles in the biological systems to create and use material structures, devices for potential benefits	K5

Course Title	ENVIRONMENTAL BOTANY AND CONSERVATION BIOLOGY	
CODE	23BOPC410	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the Structure and function of Ecosystem	K2,K3
CO-2	Know the concept of succession and concepts of biogeochemical cycles	K2,K3
CO-3	Aware of different types of pollutions and recent problems concerning with global warming, ozone depletion and effect of green house	K2,K4
CO-4	Know about the Environmental days and conservation strategies	K4
CO-5	Understand the conservation problems, analyze the causes behind the vulnerability and extinction risks of populations	K2,K3

Course Title	RESEARCH METHODOLOGY	
CODE	23BOPC411	
CO No.	Course Outcomes	Knowledge Level
CO-1	Evoke the information about various principles, methodology and uses of instruments.	K1,K2
CO-2	Acquire knowledge on extraction of phytochemical constituents	K2,K3
CO-3	Develop skill to select and define appropriate research problem and parameters.	K3, K4
CO-4	Attain the statistical knowledge and their role.	K3, K4
CO-5	Enhance the skill to write a research report, thesis and proposal	K3,K4

Course Title	PRACTICAL - III - TAXONOMY AND BIOSYSTEMATICS, GENETIC ENGINEERING AND BIOTECHNOLOGY AND ENVIRONMENTAL BOTANY AND CONSERVATION BIOLOGY	
CODE	23BOPCP03	
CO No.	Course Outcomes	Knowledge Level
CO1	Acquire knowledge of economically useful plants	K1
CO2	Apply the knowledge for identifying the plant name	K4
CO3	Understand the various habitats and their vegetation	K2
CO4	Understand the conservation problems, analyse the soil quality	K1 , K3
CO5	Apply structural and functional genomics approaches on newly sequenced genome for functional characterization of genes	K3, K4

Course Title	PRACTICALS IV - PLANT PHYSIOLOGY AND PHYTOCHEMISTRY & RESEARCH METHODOLOGY	
CODE	23BOPCP04	
CO No.	Course Outcomes	Knowledge Level
CO1	Identify soil microorganisms and their role in agriculture	K1
CO2	Analyse the phytochemicals qualitatively	K2,K3
CO3	Understand the algorithm and apply it in gene finding	K2, K4
CO4	Understand the importance of bioinformatics tools and apply it in life science research	K4
CO5	Analyse the principles and apply the working methodology of various instruments	K3