DEPARTMENT OF BOTANY

Programme specific outcomes :-MSc Botany 2019 Admission:

	Programme specific outcomes
PSO1	Develop a conceptual understanding of principles and importance of Botany. Students would be benefited with knowledge of core subjects like plant diversity, physiology and biochemistry, molecular cytogenetic and application of statistics etc. which are offered in these subjects Modules on analytical techniques, plant tissue culture and photochemistry would make them obtain skills that help in doing research.
PSO2	: Learn about practical technique in lab for detail study of plant cell structure, reproduction, anatomy, breeding procedures for hybridization. Maintain a high level of scientific excellence in botanical research with specific emphasis on the role of plants. Create, select and apply appropriate techniques, resources and modern technology in multidisciplinary way. Practice of subject with knowledge to design experiments, analyze and interpret data to reach to an effective conclusion.
PSO3	They would identify, formulate and analyze the complex problems with reaching a substantiated conclusion. Logical thinking with application of biological, physical and chemical sciences. Learning that develops analytical and integrative problem-solving approaches.
PSO4	Students would perform functions that demand higher competence in national/international organizations with sporty and helping spirits. Prepare the students for many competitive exams like MPSC, UPSC NET SET GATE.
PSO5	Best problem-solving skills in students would encourage them to carry out innovative research projects thereby making them to use knowledge creation in depth. Enable the students to be resourceful in identifying the plants
PO6	Knowledgeable, disciplined students with good values, ethics, and kind heart will help in nation building globally. Student should be aware of ethical issues and regulatory considerations while addressing society needs for growth with honesty

Course Outcomes

Semester	Course Code	Course Name	Course outcomes
I	BOT01CT01	Phycology, Bryology, Pteridology and Gymnosperms	• CO1:Describe the principles of classification algae
			• CO2:Explain the algal cytology, reproduction and pigment system in algae.
			• CO3:Understand the evolutionary relationship of different family: chlorophyceae , xanthophyceae , bacillariophyceae, phaeophyceae, rhodophyceae.

			• CO4:Students can compare the characters of different orders &relationship of each order from Cordaitales to Gnetales. Student can critically differentiate the characters of three orders of Gymnosperm i.e., Ginkogales, Coniferales, and Taxales.
			• CO5:Explain various developmental details of angiosperms.
			• CO6:Realize the significance and applications of palynology.
I	BOT01CT02	Mycology and Lichenology, Microbiology and Plant Pathology	• CO1:Students will be able to understand the structure, type and identification of Bacteria and cyan bacteria
			• CO2:Students will gain understanding of the classification, structure of mycelium reproduction of fungal species. They will know about the hazardous and useful fungi. Student will also know and learn classification and evolutionary trends in fungi.
			• CO3:Understanding of the plant diseases, causal organism, host and their relationship and control measure for plant diseases, understanding of fungicide and use of chemical physical and biological controlling of diseases mentioned in the unit.
			• CO4:Explain the classification with examples and characteristic features of Bryophytes
			• CO5:Describe the origin and evolution of bryophytes
			• CO6:Explain the general account of fossil bryophytes and their affinities and economic importance of bryophytes.
			• CO7:Describe the characteristic features of pteridophytes,cytology,structure and evolution of pteridophytes.
			• CO8:Explain the comparative morphology, ecology, phylogeny of following: psilopsida, lycopsida, sphenopsida, filicopsida and its economic importance
			• CO9:Explain the classification of gymnosperms-distribution,morphology, anatomy,reproduction, and interrelations some orders

			• CO10: Elucidate the phylogenetic relationship of gymnosperms and economic importance of gymnosperms
I	BOT01CT03	Angiosperm Anatomy, Embryology, Palynology and Lab Techniques	• CO1:Explain the general characters of fungi, classification of fungi and its phylogeny
			• CO2:Describe the general account of myxomycota, mastigomycota, zygomycota, Ascomycota, basidiomycota and mitosporic fungi
			• CO3:Explain the fungi as symbionts: lichenology: general account and systematics of lichens,thallus structure,reproductive bodies, ecological significance, and economic importance of lichens.
			• CO4:Understand main groups of microorganisms, classification of bacteria, plasmids and their characterization, cyanobacteria features,viruses general classification
			• CO5:Explain the agricultural microbiology, food microbiology and industrial microbiology.
			• CO6:PLANT PATHOLOGY-Understand the principles of plant pathology, details of different symptoms of plant diseases, process of infection.
			• CO7:Study host parasite interaction, plant disease management, and explain the disease with reference to the symptoms,causal organisms,disease cycle, and control measures
I	BOT01CP04	Practicals of Phycology, Bryology, Pteridology, Gymnosperm, Mycology, Lichenology,	• CO1:Student can identify different types of forms of algae
			• CO2:Student can classify and identify the fungal genus and specimen included.
			• CO3:Student can make micropreparation of the material of Pteridophyta and bryophytes and idenfied anatomically.
			• CO4:Student can collect few species from locality and identify morphologically during collection of material in the local visit.
			• CO5:Students can critically differentiate fossil and living fossil. Students will also understand the evolutionary tendencies and comparative morphology of Cycadales, Cycadeodales and Pteridospermales.

			• CO6:Student can classify and identify the Lichen genus and specimen included.
I	BOT01CP05	Microbiology and Plant Pathology, Angiosperm Anatomy, Embryology, Palynology and Lab Technique	• CO1:Student can identify different types of forms of cyanobacteria
			• CO2:The students will learn about the basic concepts in anatomy.
			• CO3:Study the techniques of pollen isolation and its structural study
			• CO4:Identification of the disease, pathogen, symptoms and their control measures
			• CO5:Be enlightened about the mechanism of pollination and basic structure of the embryo.
			• CO6:Understand Double staining techniques and preparation of serial sections
II	BOT02CT06	Cell Biology, Molecular Biology and Biophysics	• CO1:Student will understand the importance of cell wall. structure of nucleus, nucleolus and genome organization of prokaryotes and eukaryotes, scaffold protein. They also get to know about plasmodesmata.Mitosis and meiosis, general characters significance G S M phase and gap phase
			• CO2:Student will understand the role of various cell organelles. They will have developed knowledge about various phases of cell division. Cell communication and apoptosis and cell differentiation and cancer
			• CO3:Students will have developed knowledge about nucleus and its ultrastructure. They will also identify various forms of DNA.
			• CO4:Student will understand the importance of stresses in plants and how its responses.
			• CO5:Molecular biology gene and DNA, repetitive DNA and c-value paradox, replication of prokaryotes and eukaryotes and its enzymology. Gene expression and its regulation,operon concept, gene regulation in prokaryotes and eukaryotes. enhancers and silencers. Transcription and post transcriptional events and translation of prokaryotes and eukaryotes. mutation of gene and its significance and finally molecular evolution.

II	BOT02CT07	Cytogenetics, Genetics, Biostatistics, Plant Breeding and Evolution	• CO1:Understanding of the history of gene from 'something', 'factor'; and gene and one gene one enzyme one characters hypothesis. Student will also know the interaction of gene, genetic recombination producing the characters differently.
			• CO2:Understanding of the structure of chromosome and how the packaging of DNA occurs. Student can differentiate Euchromatin and heterochromatin region of chromosome on the basis of staining properties. Student can draw a good karyotype and Idiograms of Karyotype, and also how the evolution of Karyotype takes place.
			• CO3:understand the fundamental concepts of biostatistics
			• CO4:Familiarize with the various concepts of evolution
			• CO5: The students will understand the fundamental aspects of plant breeding involving the principles, achievementsPoly ploidy breeding significance, application, merits and demerits, mutational breeding.
II	BOT02CT08	Plant Ecology, Conservation Biology, Phytogeography and Forest Botany	• CO1:Understand habit ecology and salient features of biomass, productivity and energy flow. Population density, natality and mortality. Environmental pollution and its type and its effect on living beings. Greenhouse effect, EL-nino, LAL-nino, deforestation, over production of recourse. Rare, endangered, vulnerable, red data book. Conservation strategies, NGO, biodiversity and its significance
			• CO2:The students will understand the use of the plant resources to produce valuable products.
			• CO3:Understand phytogeographical distribution of plants, dis continuous distribution. Phytochoria world and India and endemic distribution.
			• CO4:Identify plant resources and awareness of conserving natural resources and maintaining the integrity of the indigenous culture. Forest definition, influence of forest on environment and products of forest.

II	BOT02CP09	Practicals of cellbiology, molecular biology, biophysis and cytogenetics	• CO1:Appreciate the ultra-structure of a plant cell and able to identify the cell organelles.
			• CO2:Study of mitosis in root tip,isolation of plastid and mitochondria. Chromosome banding. Working of problem in molecular genetics, SDS –PAGE, isolation of plant DNA,ELISAand western blot.
			• CO3:Able to solve problems regarding Deletion, mutation, addition etc
			• CO4:Skill development in karyotype analysis and ideogram preparation
			• CO5:preparation buffer and measurement of PH, paper and thin layer chromatography,
II	BOT02CP10	Practicals of genetics and biostatistics, plant breeding, plant ecology, conservation biology, phytogeography and forest botany	• CO1: identification of floristic region in map, BOD determination in water sample.
			• CO2:Problem solving skill in biostatistics and genetics
			• CO3:Develop skill of Plant breeding techniques
			• CO4: Develop conservation aspects
			• CO5: Awareness about the various phytogeographical areas.
			• CO6:Able to identify the forest products
III	BOT03CT-11	Plant physiology, metabolism and biochemistry	• CO1: Understand about physiological response deeply
			• CO2: Briefly discuss about photosynthesis.
			• CO3: Explain the patterns of development, stress physiology etc.
			• CO4: Appreciate the energy fixing and energy release take place in cells.
			• CO5: Discuss about different types of enzymes.
			• CO6: Elaborate carbohydrate biosynthesis and lipid biosynthesis.
			• CO7: Draw and explain the structure of biomolecules.
			• CO8: Explain secondary metabolite, physiological roles and significance

III	BOT03CT-12	Angiosperm morphology and taxonomy and plant resources	• CO1:Appreciate the physiological morphology of angiosperms
			• CO2:Identify and classify the plants based on economic principles.
			• CO3: Realize the importance of field study
			• CO4:Understand the origin of morphological parts of flower
			• CO5:Analyze modern trends in taxonomy and taxonomical developments in India.
III	BOT03CT13	Biotechnology and bioinformatics	• CO1:Critically evaluate the mechanism of tissue culture and different types of tissue culture.
			• CO2:Analyse different methods of genetic engineering
			• CO3:Explain DNA sequencing transgenic plants, cloning, patenting of genes.
			• CO4:Explain computer applications and its relevance in biology
			• CO5:Appreciate biological data base searching, protein structure predictions and emerging areas of bioinformatics
III	BOT03CP14	Practicals of Plant physiology, metabolism, biochemistry, angiosperm morphology, taxonomy	• CO1:Determine the water potential by tissue weight change method.
			• CO2:Extraction of leaf pigments by paper chromatography
			• CO3:Testing of seed viability by TTC method.
			• CO4:PH dependent activity profile of enzymes.
			• CO5:Quantitative estimation of protein by biuret
III	BOT03CP15	Practicals of plant resources, biotechnology, bioinformatics	• CO1:Identify the family up to species of plants
			• CO2:Understand various biotechnological methods and GMO plants
			• CO3: Information about Bioinformatics tools
IV	BOT04ET01	Elective I Plant tissue culture	• CO1: Understand about basics of tissue culture
			• CO2:Analyse the production and marketing of tissue culture.
			• CO3:Differentiate cultural medium of tissue culture
			• CO4:Understand about hormones, hardening of cultures

IV	BOT04ET02	Elective II Pathology of plantation crops and spices	• CO1:Understand the plantaion crops and spices of our country and their cultivation
			• CO2: Describe crop research institutes.
			• CO3:Discuss about system of reproduction, conventional methods and modern methods of plant breeding the above said groups
			• CO4:Study about various diseases and control measures
VI	BOT04EP01	Practicals of Electives	• CO1: Medium preparation
			• CO2:Study about the production plan
			• CO3: Clump inoculation
			• CO3:Morphological and floral studies of major crops
			• CO1:Understand various techniques employed for increasing crop productivity
			• CO2: Identify diseases affecting crop plants
			• CO3: Attain general awareness on various crop research stations of the country.