

Name of the Department : **BOTANY**

Name of the Program: **M.Sc. BOTANY**

CO-PO Mapping/Metrics

CO: Course Outcome

PO: Program Outcome

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO								
	To understand the origin and evolution of life on the earth	It aims to train the student in all the areas of plant sciences	To acquaint the student to become competent enough in various analytical and technical skills related to plant sciences	To enable the student to identify various life forms of plants and execute experiments related basic studies an evolution, ecology, developmental biology, Physiology, Biochemistry, Morphology, Anatomy, Reproduction, Genetics, Molecular Biology, Recombinant DNA technology, Microbiology, Plant interaction with micros and insects, and Plant Tissue Culture.	To develop the habit of identification nomenclature and classification of Magnoliophyta members	To know the tools and equipment in plant science and to develop scientific knowledge and research attitude with novel ideas	The students may apply acquired knowledge of botany in semester exams will be applied to appear UGC-CSIR joint fellowship exams, NET, SET and GATE.	The practical knowledge through field study and laboratory work will be more useful in innovative ideas to carryout quality research.

CO1BOT 101 1.This course aims to understand the origin and evolution of life	✓							
2. To know more about micro organisms bacteria and viruses								
3.The diversity of lower plants their classification, structure and growth				✓				
CO2 BOT 102 1. Students are able to focus on Morphology, Anatomy, Reproduction and evolution in Bryophyta, Pteridophyta and Cycadophyta.				✓				
2.It is also useful to conserve the lower group of plants and Cycadophyta	✓							
CO3 BOT 103 1.Students are able to understand about the diversity of								✓

higher plants, their description, identification nomenclature and their placement in the recent systems classification involving recent trends in Botany								
2.The students develop the knowledge of identification of plants growing in our surrounding areas by using Floras, Monographs, Herbaria etc.					✓			
CO4 BOT 104 1.This course imparts the knowledge of basic practical methods to solve problems						✓	✓	✓
2. The students are able to appreciate the importance of statistics in research and prepares them for their research publications						✓	✓	✓

4. This knowledge will be applied in the crop improvement in the novel traits for future generations								✓
CO2 BOT 202 1.It focuses on environmental impact assessment, energy resources, various types of environmental pollution, water pollution conservation strategies with sustainable management				✓				
2. Students will understand factors leading to environmental degradation, their reason and their impact on the environment.	✓							
3. Student will be able to understand the distribution of plants and their diversity with respect to geographical area.	✓							

4. Evolution subject deals with the orgin of life on the earth, progressive changes in the environment lead to the origin of species and geological time scale	✓							
CO3 BOT 203 1. This course aims to make the students to understand about equipments with the fundamentals and mechanisms associated with the development, differentiation and maphogenesis of various plant organs.				✓	✓			
2. it is also associated with metabolic and physiological changes during growth and development .				✓	✓			

3.It aims to understand the students about the structure and function of reproductive organs and their significance in pollination, fertilization, embryogenesis and endosperm.								✓
4. This will helpful to apply the knowledge in agriculture, horticulture for the production of hybrid, novel and rare plants.								✓
5. The allergy problems arised by pollen can be justified								✓
CO4 BOT 204 1. This paper aims with the understanding of diversification, utility and conservation strategies of natural resources.					✓			

2. This course is helpful to understand the student about various types of economically useful plants and their uses.								✓
3. Students can understand the conservation of various types of economically useful plants for future use.								✓
CO1 BOT 301 1.This course aims to educate about the mechanism of biophysical and biochemical processes, transpiration, ion uptake, translocation of organic solutes						✓	✓	
2. Students will understand more about photo chemistry, photo synthesis and path ways for the synthesis of starch and sucrose. It also aims to understand the pocess of				✓				

catabolism like respiration and nitrogen fixation (biological), regulation of nifgenes in nitrogen fixing organisms and their transefer into higher plants								
3 This course is aim to understand the role phyto harmones and their physiological effects on growth and development, flowering process among the higher plants				✓				✓
4. It is useful to know more about the structural and the functional aspects of biomolecular and their metabolism						✓		
CO2 BOT 302 1.This course will help the students to equire the knowledge about structure and functions of DNA,						✓	✓	✓

RNA, transcription and translation among the prokaryotes and eukaryotes								
2. It is also useful to know about the structure and function of restriction enzymes and cloning vectors and transfer of genes			✓				✓	
3. to understand about the application of different types of markers like RFLP, RAPD and AFLP in r-DNA technology for the production of transgenic plants and organisms						✓		

CO3 BOT303 Elective-I (a) 1. The course is designed to understand more about plant breeding systems and hybridization technology.	✓				✓			✓
2. It is also useful to understand about numerical taxonomy, cladistics and molecular biological approaches for classification of plants	✓							✓
CO3 BOT 303 Elective-I (b) 1. The paper deals with the microbial intractions, plant microbes intractions and nitrogen fixtion in root nodules	✓			✓		✓	✓	
2. Students can understand the microbial communities in nature and their adaptations to environmental conditions 3. It aims to	✓						✓	

impart the knowledge of distribution of micro organisms in air, water and soil, role of microbes in nutrient cycles like Carbon, Nitrogen, Phosphorus, Sulphur.						✓	✓		
4. Students will understand the role of microbial organisms in sewage treatment, biodegradation of pesticides, leaching and biomagnifications								✓	
CO3 BOT 303 Elective-I (c) 1. This course aims to increase the understanding of the students about the phyto chemistry, medicinal plants in human welfare						✓	✓		

2. Students also know more about active principle of secondary Metabolites- alkaloids, flavonoids, steroids, terpenoids and phenolic constituents.			✓	✓		✓	✓	
3. Students also know more about Therapeutic uses of plant drugs and how to extract crude drags from various parts of the plants?							✓	✓
CO4 BOT 304 Elective-II (a) 1. This course aims to understand the students about				✓		✓	✓	

the basic properties of plant cell, cell differentiation, morphogenesis etc.								
2. Students will learn about the role of micro and micronutrients on the growth of cultured cells				✓			✓	
3. Practically students can handle instruments to carryout inoculation, intubation and field transfer techniques of plants				✓				
4 Students will develop the skill of the production of novel plant, rare plants, and somatic hybrids by using plant tissue culture techniques' 5. They learn the skill of micro propagation and cryopreservation of Germ plasm.						✓		

CO4 BOT 304 Elective-II (b) 1. This course designed to provide the knowledge about the molecular mechanism of photo synthetic systems protein transfer in chloroplast						✓	✓	
2. It also imparts the understanding of calcium modulation proteins, signal perception and transduction				✓				
3. Students can understand the physiology of light induced response at cellular level				✓				
4. It imparts the knowledge of molecular biology aspects of plants stress response						✓	✓	

CO4 BOT 304 Elective-II (c) 1. This course focuses on gene interactions, multiple gene hypothesis and sex determination in <i>Drosophila</i> . It is designed to understand the students more about linkage, crossing over and epigenetics			✓	✓		✓	✓	✓
2. It also aims to know more about breeding techniques for the production of hybrid plants in crop improvement programme						✓		✓
CO1 BOT 401 1.This paper is designed to understand the students more about the distribution of biodiversity indicators and benefits of	✓						✓	✓

biodiversity etc. 2. This paper deals with the understanding of threats to biodiversity, IUCN red list, <i>in situ</i> conservation methods and <i>ex situ</i> conservation methods of biodiversity								
3. Students can understand about biogeographic zones, forest biodiversity, biodiversity hot spots, floral diversity of wild and domesticated plants, policies to conserve biodiversity including financial incentives, market based instruments, National Legislations to conserve biodiversity		✓						✓
CO2 BOT 402 1. This course will help the students to acquire the skills of r- DNA technology for the tranfer of				✓		✓	✓	

genes for the production of transgenic plants								
2. To gain the knowledge of strategies for engineering of biotic and abiotic resistant plants						✓		✓
3. It also acquires the knowledge to design the plants as bioreactors for the production of useful compounds to man kind						✓		
CO3 BOT 403 Elective 1-(a) 1. This course is designed to understand about the tribal people of forest area and their role for the conservation of useful plants for the welfare of human beings	✓					✓		✓
2. Students can understand the diversification of tribal groups of forest areas and their interaction with plants and their magico								✓

religious belifes, social customs taboos								
3. Studernts can gain the knowledge of categorising ethnomedicine and ethnovetenary medicine. And role of ethnobotany in the convservation NPGR and Biodiversity.								✓
CO3 BOT 403 Elective 1-(b) 1. This course focuses on gene interactions, multiple gene hypothesis and sex determination in <i>Drosophila</i> it is designed to understand the students more about likage, crossing over and epigenetic			✓	✓		✓	✓	

2. It also aims to know more about breeding techniques for the production of hybrid plants in crop improvement programme						✓		
3. Students can acquire the knowledge to induce polyploidy breeding for abiotic and biotic resistant plant production in crop improvement programme						✓		
CO3 BOT 403 Elective 1-(c) 1. This course is designed to understand the origin of agriculture, mutation breeding for crop improvement.		✓				✓	✓	✓
2. Students can understand the usage of eco friendly, biofertilizers and biocontrol methods		✓						✓

3. This paper inculcate the knowledge of modern agriculture methods and role of national and International organizations in crop improvement						✓		✓
CO4 BOT 404 Elective II-(a) 1. This course aims to understand the usage of botanical insect aside for the biocontrol of fungal bacterial and viral diseases of plants		✓				✓		✓
2. To understand more about the biology of fungi and bacteria for the control of insects, genetic engineering approaches for weed resistance		✓						✓

CO4 BOT 404 Elective II-(b) 1. The objective of the present course content is to provide the information about fermentation technology for the production of citric acid, penicillin, ethanol, beer etc.		✓				✓		✓
2. Students will understand the role of bacteria and fungi for the large scale production of useful products for man kind like cheese, single cell protein beer etc.		✓				✓		

CO4 BOT 404 Elective II-(c) 1. This paper is designed to understand about the economic importance of the algae for the industrial production of cosmetics pharmaceutical, agricultural and biofeouel	✓							✓
2. It also aims to impact the knowledge of single cell protein production, mass cultivation and commercial value of sea veeds.								✓