

**MANONMANIAM SUNDARANAR UNIVERSITY,
TIRUNELVELI
SREE AYYAPPA COLLEGE FOR WOMEN
B.Sc. BOTANY
(Academic year 2023 - 2024)**

SEMESTER I	NAME OF THE COURSE	Hours Per/ Week (Lecture/Tutorial)	CREDIT
Part I Part II	Part -I - Language – Paper I	6	3
	Part - II - English– Paper I	6	3
Part III Core I	Part - III - Core – Plant Diversity I – Algae	5 (3+2)	5
Core II	Plant Diversity I Algae - Practical-I	3 (1+2)	5
Elective Course EC 1 Discipline Specific/Generic	Part -III - Allied: Zoology - Paper – I	4 (3+1)	3
	Allied practical	2	2
Part - IV Skill Enhancement Courses SEC1	1. Organic farming 2. Environmental Biotechnology 3. Nursery and Landscaping	2	2
Foundation Course FC	Basics of Botany	2	2
Total		30	23
SEMESTER II	NAME OF THE COURSE	Hours Per/ Week (Lecture/Tutorial)	CREDIT
Part I Part II	Part -I - Language – Paper I I	6	3
	Part - II - English– Paper II	6	3
Part III Core III	Part - III - Core - Plant Diversity II – Fungi, Bacteria, Viruses, Plant pathology and Lichens	5 (3+2)	5
Core IV	Plant Diversity II - Fungi, Bacteria, Viruses, pathology and Lichens – Practical II	3 (1+2)	3
Elective Course EC 2 Discipline Specific/Generic	Part -III - Allied: Zoology Paper – II	4 (3+1)	3
	Allied practical	2	2
Part - IV Skill Enhancement Courses SEC 2	1. Mushroom cultivation 2. Herbal Medicine 3. Global Climate change	2	2
Skill Enhancement Courses SEC 3	Botanical garden and landscaping	2	2
Total		30	23

Sem.	Part	Sub. No.	Subject Status	Subject	Course Paper	Hrs./ Week	Credit
III	I	17	Language	Tamil	1	6	4
	II	18	Language	English	1	6	4

	III	19	Core III	Fungi, Plant Pathology and Lichenology	1	4	4
	III	20	Major Practical III	Fungi, Plant Pathology and Lichenology – Practical	1	2	2
	III	21	Allied – I Paper I		1	4	3
	III	22	Allied Practical I	Practical	1	2	2
	III	23	Skill Based	Mushroom Culture Technology - I(A)	1	4	4
				Organic Farming - I(B)			
	IV	24	Non-Major Elective I	Gardening and Garden Management - I(A)	1	2	2
				Herbal Medicine - I(B)			
	IV		Common	Yoga	-	-	2
				Sub Total	8	30	27
IV	I	25	Language	Tamil	1	6	4
	II	26	Language	English	1	6	4
	III	27	Core IV	Pteridophytes, Gymnosperms and Paleobotany	1	4	4
	III	28	Major Practical IV	Pteridophytes, Gymnosperms and Paleobotany - Practical	1	2	2
	III	29	Allied II - Paper II		1	4	3
	III	30	Allied Practical II	Practical	1	2	2
	IV	31	Skill Based	Floriculture - I(A)	1	4	4
				Preservation of Fruits and Vegetables - I(B)			
	IV	32	Non-Major Elective II	Food and Nutrition - II(A)	1	2	2
				Botany for Competitive Examination - II(B)			
	IV		Common	Computers for Digital Era	-	-	2
	V	33	Extension Activities	NCC / NSS / YRC / YWF	-	-	1
				Sub Total	8	30	28

Sem.	Part	Sub. No.	Subject Status	Subject	Course Paper	Hrs./ Week	Credit
V	III	34	Core V	Cell Biology and Embryology of Angiosperms	1	5	4
	III	35	Core VI	Morphology and Taxonomy of Angiosperms	1	5	4
	III	36	Core VII	Biochemistry and Bioinformatics	1	5	4
	III	37	Elective - I	Plant Ecology and Phytogeography - I(A)	1	5	4
				Marine Biotechnology - I(B)			
	III	38	Major Practical - V	Cell Biology, Embryology, Morphology and Taxonomy of Angiosperms - Practical	1	2+2	2
	III	39	Major Practical VI	Biochemistry, Bioinformatics and Elective – I Practical	1	2+2	2
	IV	40	Skill Based Common	Personality Development	1	2	2
Effective Communication							
Youth Leadership							
			Sub Total	7	30	22	
VI	III	41	Core VIII	Genetics, Evolution and Biostatistics	1	5	4
	III	42	Core IX	Plant Physiology	1	5	4
	III	43	Core X	Microbiology	1	4	4
	III	44	Elective I	Horticulture and Plant Breeding - I(A)	1	4	4
				Forestry - I(B)			
	III	45	Elective II	Plant Biotechnology and Genetic Engineering - II(A)	1	4	4
				Environmental Biotechnology - II(B)			
	III	46	Major Practical VII	Genetics, Evolution, Biostatistics and Elective - I Practical	1	2+1	2
	III	47	Major Practical VIII	Plant Physiology - Practical	1	2	2
	III	48	Major Practical IX	Microbiology and Elective II - Practical	1	2+1	2
			Sub Total	8	30	26	

Programme: B.Sc. Botany	
Programme Code:	
Duration: 3 years	
Programme Out comes (PO)	
The B.Sc. Botany program is designed to achieve the following objectives	
PO1	Apply the knowledge of science and technology fundamentals for findings solution for complex problems.
PO2	To provide up to date theoretical knowledge on various forms of plants, their interactions with biotic and abiotic entities in the ecosystem and relevant practical skills.
PO3	To comprehend and interpret various facets of Botany including the importance and judicious utilization of plant sources.
PO4	Exploration of diverse plant life-forms and to nature the conservation of biodiversity.
PO5	To understand the principles and applications of various traditional and modern techniques used in Botany.
PO6	To disseminate knowledge on the design and execution of experiments in Botany with emphasis on the operation of relevant sophisticated instruments.
PO7	To impart knowledge on the economic importance of plant/microbial resources and their products and to promote entrepreneurship skill.
PO8	To promote proficiency in designing the research problems, review of literature, laboratory experiments, data analyses and preparation of reports with professional ethics.
PO9	To motivate the students to take up innovative and cutting-edge research in frontier areas of Botany and related biology subjects.
PO10	To enable the students to take up various qualifying examinations concerning Botany and to face the challenges in career opportunities.
Program specific Outcomes (PSO)	
On successful completion of the B.Sc. Botany program, the students are expected to	
PSO1	Implement the concept of science and technology to foster the traditional and modern techniques for solving the complex problems in Plant Biology.
PSO2	Ensure the use of contemporary tools and techniques in understanding the scope and significance of Botany
PSO3	Develop the scientific problem solving skills during experimentation, research projects, analysis and interpretation of data
PSO4	Design scientific experiments independently and to generate useful information to address various issues in Botany.
PSO5	Enhanced capacity to think critically; ability to design and execute experiments independently and/or team under multidisciplinary settings

PSO6	Design and standardize protocols for public health and safety, and cultural, societal, and environmental considerations
PSO7	Apply appropriate techniques, resources, and modern ICT tools for understanding plant resources.
PSO8	Demonstrate the contextual knowledge in sustainable exploitation of medicinal, economically important and endangered plants as per the National Biodiversity Act.
PSO9	Follow the concept of professional ethics and bioethics norms for practicing the value of plant kingdom.
PSO10	Communicate proficiently with various stakeholders and society, to comprehend and to write and present reports effectively

SEMESTER - I

Title of the Course		PLANT DIVERSITY I ALGAE					
Paper Number		CORE I					
Category	Core	Year	I	Credits	5	Course Code	
		Semester	I				
Instructional Hours per week		Lecture	Tutorial		Lab Practice	Total	
		3	2		--	5	
Pre-requisite		Students should be familiar with the basics of different classes of algae.					
Learning Objectives							
C1	To provide a comprehensive knowledge on the biology of algae.						
C2	To provide a basis for better understanding of the evolution higher of plants.						
C3	To understand reproductive biology, ecology of plants by studying the simpler systems in algae.						
C4	To understand the role of algae in ecosystems as primary producers of nutrition.						
C5	To understand importance of algae to animals and humans.						
Course outcomes	On completion of this course, students will be able to:						
CO1	Relate to the structural organization, reproduction and significance of algae.					K1	
CO2	Demonstrate knowledge in understanding the various life cycle patterns and the fundamental concepts in algal growth					K2	
CO3	Explain the benefits of various algal technologies on the ecosystem.					K3	
CO4	Compare and contrast the thallus organization and modes of reproduction in algae.					K4	

CO5	Determine the emerging areas of Algal Biotechnology for identifying commercial potentials of algal products and their uses.	K5
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CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To understand the general characters and classification and lifecycle of Algae.	PO1, PO2	PSO1, PSO2	C
CO. 2	To comprehend Algae systematic position, structure, reproduction, and economic significance.	PO2, PO3	PSO3, PSO4	K, C
CO. 3	To examine and analyse various plant Seaweed cultivation and describe about their economic importance of Algae	PO3, PO4, PO5	PSO5, PSO6	An
CO. 4	To examine and analyse various plant mass culture and describe about their economic importance.	PO3, PO4, PO5	PSO5, PSO6	An
CO. 5	To understand the general characters and classification and lifecycle of Bryophytes.	PO4, PO5	PSO6, PSO7	Ap, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

ALGAE AND BRYOPHYTES												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	3	3	3	2	2	3	3	3	3	3	2
2	3	3	2	3	2	3	3	3	2	2	3	2
3	2	3	2	3	2	2	2	3	2	2	3	2
4	2	3	2	3	2	2	2	3	2	3	2	1
5	2	3	3	3	2	1	3	2	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

Title of the Course	PLANT DIVERSITY – I: ALGAE Practical I						
Paper Number	CORE II						
Category	Core	Year	I	Credits	3	CourseCode	
		Semester	I				
Instructional Hours per week	Lecture		Tutorial		Lab Practice		Total
	1		-		2		3
Pre-requisite	Students should be familiar with the basics of algae.						
Learning Objectives							
C1	To develop skills to identify algae based on habitat, thallus structure and the internal organization.						
C2	To identify microalgae in a mixture.						
C3	To develop skills to prepare the microslides of algae.						
C4	To study the economic importance of few species.						
C5	To understand importance of algae to animals and humans						
Course outcomes:	On completion of this course, the students will be able to						Programme outcomes
CO							
CO1	Recall and identify algae using key identification characters.						K1
CO2	Demonstrate practical skills in preparation of fresh mount and identification of algal forms from algal mixture.						K2
CO3	Describe the internal structure of algae prescribed in the syllabus						K3
CO4	Decipher the algal diversity in fresh/marine water and their economic significance						K4
CO5	Evaluate the various techniques used to culture algae for commercial purposes						K5

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	2	1	2	3	2	1
CO 2	3	3	2	2	3	3	2	3	3	3
CO 3	2	2	3	3	1	2	1	3	1	2
CO 4	3	3	3	3	3	2	3	3	3	2
CO 5	3	3	2	2	2	3	3	3	2	3

Title of the Course	ALLIED BOTANY-I									
Paper Number	Core-Allied-I									
Category	Core	Year		I	Credits		3		Course Code	
		Semester		I						
Instructional Hours per week		Lecture			Tutorial		Lab Practice		Total	
		3			1		-		4	
Pre-requisite		To study the basics of botany.								
Learning Objectives										
C1		To study morphological and anatomical adaptations of plants of various habitats.								
C2		To demonstrate techniques of plant tissue culture.								
C3		To familiarize with the structure of DNA, RNA.								
C4		To carryout experiments related with plant physiology.								
C5		To perform biochemistry experiments.								
Course outcomes:		On completion of this course, the students will be able to:							Programme outcomes	
CO1		Increase the awareness and appreciation of human friendly algae and their economic importance.							K1	
CO2		Develop an understanding of microbes and fungi and appreciate their adaptive strategies.							K2	
CO3		Develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms.							K3	
CO4		Compare the structure and function of cells and explain the development of cells.							K4	

CO5	Understand the core concepts and fundamentals of plant biotechnology and genetic engineering.	K5
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Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	3	3	3	3	3	3	3	3	3
CO 2	3	3	3	3	3	3	3	3	3	3
CO 3	2	3	3	3	3	1	3	3	3	3
CO 4	3	3	2	3	3	3	2	3	2	3
CO 5	3	2	2	2	2	2	2	1	2	1

S-Strong (3) M-Medium (2) L-Low(1)

ELECTIVE ALLIED BOTANY PRACTICALS

Title of the Course	ALLIED BOTANY PRACTICALS						
Paper Number	Core-Allied Practicals-I						
Category	Core	Year	I	Credits	2		Course Code
		Semester	I				
Instructional Hours per week	Lecture		Tutorial		Lab Practice	Total	
			-		2	2	
Pre-requisite	Practicals pertaining to above subjects is important to get knowledge on various aspects of plants.						
Learning Objectives							
C1	To enhance information on the identification of each taxonomical group by developing the skill-based detection of the morphology and microstructure of microorganisms, algae, and fungi.						

C2	To comprehend the fundamental concepts and methods used to identify Bryophytes, Pteridophytes and Gymnosperms through morphological changes and evolution, anatomy and reproduction.	
C3	To be familiar with the basic concepts and principles of plant systematics.	
C4	Understanding of laws of inheritance, genetic basis of loci and alleles.	
C5	To learn about the physiological processes that underlie plant metabolism.	
Course outcomes: CO	On completion of this course, the students will be able to	Programme Outcomes
CO1	To study the internal organization of algae and fungi.	K1
CO2	Develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms.	K2
CO3	To study the classical taxonomy with reference to different parameters.	K3
CO4	Understand the fundamental concepts of plant anatomy and embryology.	K4
CO5	To study the effect of various physical factors on photosynthesis.	K5

MAPPING

	COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
K: Str S- Strong (3) M-Medium (2) L-Low(1)	CO 1	3	3	3	3	3	3	3	3	3	3
	CO 2	3	3	3	3	3	3	3	3	3	3
	CO 3	2	3	3	3	3	1	3	3	1	3
	CO 4	3	3	2	3	3	3	3	2	3	3
	CO 5	3	2	2	2	2	2	2	1	2	2

SKILL ENHANCEMENT COURSE - SEC - 1

3. NURSERY AND LANDSCAPING

Title of the Course		NURSERY AND LANDSCAPING								
Paper Number		Non-Major Elective-I								
Category	Elective	Year	I	Credits	2	Course Code				
		Semester	I							
Instructional Hours per week		Lecture		Tutorial		Lab Practice		Total		
		2		-		-		2		
Pre-requisite		Students should know about the fundamental concepts of nursery and landscaping.								
Learning Objectives										
C1		To recognize the importance of growing plants and practice the knowledge gained by developing kitchen garden and ornamental garden.								
C2		To be able to design gardens and become entrepreneur in Horticulture.								
C3		To study the methods of propagation.								
C4		To know about nursery structure.								
C5		To learn about gardening.								
Course outcomes:		On completion of this course, the students will be able to:						Programme Outcomes		
CO										
CO1		Recognize the basic principles and components of gardening.						K1		
CO2		Explain about bio-aesthetic planning and conceptualize flower arrangement.						K2		
CO3		Apply techniques for design various types of gardens according to the culture and art of bonsai.						K3 & K6		
CO4		Compare and contrast different garden styles and landscaping patterns.						K4		
CO5		Establish and maintain special types of gardens for outdoor and indoor landscaping.						K5 & K6		

MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	3	2	1	2	2	1	3
CO 2	3	3	2	2	3	3	2	2	2	2
CO 3	2	2	3	1	1	1	1	3	3	1

CO 4	3	2	2	1	3	2	1	3	2	1
CO 5	3	3	2	3	2	1	2	3	2	3

MS-Strong (3) M-Medium (2) L-Low(1)
FOUNDATION COURSE FOR BOTANY

Title of the Course	BASICS OF BOTANY									
Paper Number	Foundation Course									
Category	Elective	Year	I	Credits	2	Course Code				
		Semester	I							
Instructional Hours	Lecture	Tutorial	Lab Practice	Total per week	2	-	-			
2										
Pre-requisite	To recall the students about the basic aspects of botany.									
Learning Objectives										
C1	To learn about the classification, distinguishing traits, geographic distribution, and reproductive cycle of algae, fungi, lichens, and bryophytes.									
C2	To understand the biodiversity by describing and explaining the morphology and reproductive processes of algae, fungi, bryophytes and microorganisms.									
C3	To investigate the classification, distinctive traits, distribution and reproduction and life history of the various classes and major types of Pteridophytes and Gymnosperms.									
C4	Enable to learn various cell structures and functions of prokaryotes and eukaryotes and understand the salient features and functions of cellular organelles.									
C5	Understanding of laws of inheritance, genetic basis of loci and alleles.									
Course outcomes	On completion of this course, the students will be able to Programme Outcomes									
CO1	Increase the awareness and appreciation of human friendly algae and their economic importance.						K1			
CO2	Develop an understanding of microbes and fungi and appreciate their adaptive strategies.						K2			
CO3	Develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms.						K3			
CO4	Compare the structure and function of cells and explain the development of cells.						K4			
CO5	Understand the core concepts and fundamentals of plant biotechnology and genetic engineering.						K5			

Mapping

	COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
Str S-Strong (3) M-Medium (2) L-Low(1)	CO 1	3	3	3	3	3	3	3	3	3	3
	CO 2	3	3	3	3	3	3	3	3	3	3
	CO 3	2	3	3	3	3	1	3	3	1	3
	CO 4	3	3	2	3	3	3	3	2	3	3
	CO 5	3	2	2	2	2	2	2	1	2	2

CORE-III PLANT DIVERSITY II FUNGI, BACTERIA, VIRUSES, PLANT PATHOLOGY AND LICHENS

Title of the Course		PLANT DIVERSITY – II: FUNGI, BACTERIA, VIRUSES, PLANT PATHOLOGY AND LICHENS									
Paper Number		CORE III									
Category	Core III	Year	I	Credits	5	Course Code					
		Semester	II								
Instructional Hours per week		Lecture		Tutorial		Lab Practice		Total			
		3		2		--		5			
Pre-requisite		Students should be familiar with the basics of fungi, bacteria, viruses and lichens.									
Learning Objectives											
C1	To describe the common characteristics of fungi as being heterotrophic, unicellular/multicellular.										
C2	To understand the biology of fungi and to discuss the importance of fungi in various ecological roles										
C3	To understand lichen structure, function, identification, and ecology; Comprehend the events of symbiosis and lichenization and to demonstrate the use of lichens as bioindicator species.										
C4	To identify the main groups of plant pathogens, their symptoms.										
C5	To understand the various types of plant diseases.										

Course outcomes: CO	On completion of this course, the students will be able to:	Programme outcomes
CO1	Recognize the general characteristics of microbes, fungi and lichens and disease symptoms.	K1
CO2	Develop an understanding of microbes, fungi and lichens and appreciate their adaptive strategies based on structural organization.	K2
CO3	Identify the common plant diseases, according to geographical locations and devise control measures.	K3
CO4	Analyze the emerging trends in fungal biotechnology with special reference to agricultural and pharmaceutical applications.	K4
CO5	Determine the economic importance of microbes, fungi and lichens	K5

Mapping with Programme Outcomes: S-Strong (3) M-Medium (2) L-Low(1)

COs	COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	3	1	3	2	1	2	2	2	2
CO 2	3	3	2	2	3	3	2	1	2	1
CO 3	2	2	3	3	1	2	1	3	1	3
CO 4	3	3	3	3	3	2	3	3	3	3
CO 5	3	3	2	3	2	3	3	3	3	3

IV PLANT DIVERSITY II FUNGI, BACTERIA, VIRUSES, PATHOLOGY AND LICHENS - PRACTICAL-II

Title of the Course	PLANT DIVERSITY – I: FUNGI, BACTERIA, VIRUSES, PLANT PATHOLOGY AND LICHENS –Practical II									
Paper Number	Non-Major Elective-I									
Category	Elective	Year	I	Credits	3	Course	II			

		Semester	I			Code	
Instructional Hours per week	Lecture		Tutorial		Lab Practice		Total
	1		2		3		6
Pre-requisite	Students should be familiar with the basics of fungi and lichens.						
Learning Objectives							
C1	To enable students to identify microscopic and macroscopic fungi.						
C2	To prepare microslides of fungi and lichens.						
C3	To know the presence of pathogen inside the plant tissues through microscopic sections.						
C4	To identify the bryophytes based on the morphology, and microslides.						
C5	To know the economic importance of the microbes studied.						
Course outcomes:	On completion of this course, the students will be able to:						Programme Outcomes
CO							
CO1	Identify microbes, fungi and lichens using key identifying characters						K1
CO2	Develop practical skills for culturing and cultivation of fungi.						K2
CO3	Identify and select suitable control measures for the common plant diseases.						K3
CO4	Analyze the characteristics of microbes, fungi and plant pathogens						K4
CO5	Access the useful role of fungi in agriculture and pharmaceutical industry						K5

COs	COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	3	1	3	2	1	2	2	2	2
CO 2	3	3	2	2	3	3	2	1	2	1
CO 3	2	2	3	3	1	2	1	3	1	3
CO 4	3	3	3	3	3	2	3	3	3	3
CO 5	3	3	2	3	2	3	3	3	3	3

S-Strong (3) M-Medium (2) L-Low(1)

ELECTIVE ALLIED BOTANY-II

Title of the Course		ALLIED BOTANY-II					
Paper Number		Allied-II					
Category	Core III	Year	I	Credits	3	Course Code	
		Semester	II				
Instructional Hours per week		Lecture	Tutorial	Lab Practice	Total		
		3	21	--	4		
Pre-requisite		To study basics of botany					
Learning Objectives							
C1	To be familiar with the basic concepts and principles of plant systematics.						
C2	Learn the importance of plant anatomy in plant production systems.						
C3	Understand the mechanism underling the shift from vegetative to reproductive phase						
C4	To learn about the physiological processes that underlie plant metabolism.						
C5	To know the energy production and its utilization in plants.						
Course outcomes: CO	On completion of this course, the students will be able to:					Programme outcomes	
CO1	Understand the fundamental concepts of plant anatomy and embryology					K1	
CO2	Analyze and recognize the different organs of plants and secondary growth.					K2	
CO3	Understand water relation of plants with respect to various physiological processes					K3	

CO4	Classify aerobic and anaerobic respiration	K4
CO5	Classify plant systematics and recognize the importance of herbarium and virtual herbarium	K5

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	3	3	3	3	3	3	3	3	3
CO 2	3	3	3	3	3	3	3	3	3	3
CO 3	2	3	3	3	3	1	3	3	3	3
CO 4	3	3	2	3	3	3	3	2	3	2
CO 5	3	2	2	2	2	2	2	1	2	2

S-Strong (3) M-Medium (2) L-Low(1)

ELECTIVE ALLIED BOTANY PRACTICALS

Title of the Course	ALLIED BOTANY PRACTICALS						
Paper Number	Core-Allied Practicals-I						
Category	Core	Year	I	Credits 2		Course Code	
		Semester	II				
Instructional Hours per week	Lecture		Tutorial		Lab Practice	Total	
			-		2	2	
Pre-requisite	Practicals pertaining to above subjects is important to get knowledge on various aspects of plants.						
Learning Objectives							
C1	To enhance information on the identification of each taxonomical group by developing the skill-based detection of the morphology and microstructure of microorganisms, algae, and fungi.						

C2	To comprehend the fundamental concepts and methods used to identify Bryophytes, Pteridophytes and Gymnosperms through morphological changes and evolution, anatomy and reproduction.	
C3	To be familiar with the basic concepts and principles of plant systematics.	
C4	Understanding of laws of inheritance, genetic basis of loci and alleles.	
C5	To learn about the physiological processes that underlie plant metabolism.	
Course outcomes: CO	On completion of this course, the students will be able to	Programme Outcomes
CO1	To study the internal organization of algae and fungi.	K1
CO2	Develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms.	K2
CO3	To study the classical taxonomy with reference to different parameters.	K3
CO4	Understand the fundamental concepts of plant anatomy and embryology.	K4
CO5	To study the effect of various physical factors on photosynthesis.	K5

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	3	3	3	3	3	3	3	3	3
CO 2	3	3	3	3	3	3	3	3	3	3
CO 3	2	3	3	3	3	1	3	3	1	3
CO 4	3	3	2	3	3	3	3	2	3	3
CO 5	3	2	2	2	2	2	2	1	2	2

S-Strong (3)

M-Medium (2)

L-Low(1)

SKILL ENHANCEMENT COURSE - SEC - 2
1. MUSHROOM CULTIVATION

Title of the Course	MUSHROOM CULTIVATION
Paper Number	Non-Major Elective-II

Category	Elective	Year	I	Credits	2	Course Code
		Semester	II			
Instructional Hours per week	Lecture		Tutorial		Lab Practice	Total
	2		-		-	2
Pre-requisite		Basic knowledge on structure and function of various groups of mushrooms.				
Course Objectives						
C1	To learn and develop skills in mushroom cultivation.					
C2	To understand and appreciate the role of mushrooms in Nutrition, Medicine and health.					
C3	To cultivate mushroom cultivation in small scale industry.					
C4	To learn about diseases and post harvest technology.					
C5	To study new methods and strategies to contribute to mushroom production.					
Course outcomes:	On completion of this course, the students will be able to:					Programme Outcomes
CO						
CO1	Recall various types and categories of mushroom.					K1
CO2	Explain about various types of food technologies associated with mushroom industry.					K2
CO3	Apply techniques studied for cultivation of various types of mushroom.					K3
CO4	Analyze and decipher the environmental factors and economic value associated with mushroom cultivation.					K4
CO5	Develop new methods and strategies to contribute to mushroom production.					K5 & K6

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	S			S	M	L	M	M
CO 2	S			M		S	M	S
CO 3	M			S		M		S
CO 4	S	S	S	S		M		S
CO 5	S	S	M				S	S

S-Strong (3) M-Medium (2) L-Low(1)

SKILL ENHANCEMENT COURSE 3

BOTANICAL GARDEN AND LANDSCAPING

Title of the Course	BOTANICAL GARDEN AND LANDSCAPING					
Paper Number	Skill Enhancement-3					
Category	Elective	Year	I	Credits	2	Course Code
		Semester	II			
Instructional Hours per week	Lecture		Tutorial		Lab Practice	Total
	2		-		-	2
Pre-requisite	Students should know about the fundamental concepts of gardening and landscaping					
Course Objectives						
C1	To know about the fundamental concepts of gardening and landscaping.					
C2	To provide an overview of various gardening styles and its scope in recreation and bio-aesthetic planning.					
C3	To illustrate the significance of garden adornments and propagation structures.					
C4	To inculcate entrepreneurial skills in students for creative landscaping design using CAD software.					
C5	To create the design outdoor and indoor gardens and inculcate entrepreneurial skills for landscaping.					
Course outcomes:	On completion of this course, the students will be able to:					Programme Outcomes
CO						
CO1	Recognize fundamental concepts of gardening and landscaping.					K1
CO2	Explain about significance of garden adornments and propagation structures.					K2
CO3	Apply techniques of landscaping for aesthetic purposes and gardening for recreation.					K3 &K6

CO4	Distinguish between formal, informal and free style gardens and their applications.	K4
CO5	Develop and design outdoor and indoor gardens and inculcate entrepreneurial skills for landscaping.	K5 & K6

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	2	1	1	2	3	1
CO 2	3	3	2	2	1	3	2	3	3	2
CO 3	2	2	3	2	1	2	1	3	2	3
CO 4	3	3	2	3	1	2	3	3	3	2
CO 5	3	3	2	3	2	3	1	3	3	2

S-Strong (3)

M-Medium (2)

L-Low(1)

**MSU/ 2021 - 2022 UG – Colleges/Part – III (B.Sc. Botany)
SEMESTER -III
CORE PAPER – III. FUNGI, PLANT PATHOLOGY AND
LICHENOLOGY(CMBO31)
(4 hrs/week)**

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To understand the classification and Life cycle of fungi.	PO1, PO2	PSO1, PSO2	C
CO. 2	To comprehend fungi's systematic position, structure, reproduction, and economic significance.	PO2, PO3	PSO3, PSO4	K, C
CO. 3 & 4	To examine and analyse various plant diseases and describe about their control measures	PO3, PO4, PO5	PSO5, PSO6	An
CO. 5	To appraise the lichens and their classification and review their economic importance.	PO4, PO5	PSO6, PSO7	Ap, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

FUNGI, PLANT PATHOLOGY AND LICHENOLOGY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	2	2	3	3	2	2	3	3	3	3	2	2
2	2	1	3	3	2	2	3	3	2	2	3	2
3	2	1	3	3	2	1	3	3	2	1	3	1
4	3	3	3	3	2	1	3	3	2	1	3	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

**MSU/ 2021 - 2022 UG – Colleges/Part – III (B.Sc. Botany)
SEMESTER -III
MAJOR PRACTICAL PAPER – III. FUNGI, PLANT
PATHOLOGY AND LICHENOLOGY(CMBOP3)
(2 hrs/week)**

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To understand various techniques used in micropreparation and identification of fungi, lichen	PO1, PO2	PSO1, PSO2	K, C
CO. 2	To observe and identify various diseases in plants caused by the pathogens	PO3, PO4	PSO3, PSO4	Ap, An
CO. 3	To record all the observation and conclusion	PO4, PO5	PSO5, PSO6	S, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

FUNGI, PLANT PATHOLOGY AND LICHENOLOGY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	1	2	3	2	2	2	3	2	3	3	2	2
2	2	1	3	3	2	2	3	3	2	2	3	2
3	1	1	3	3	2	1	3	3	2	1	3	1
4	3	3	3	3	2	1	3	3	2	1	3	1
5	2	3	3	3	2	2	2	3	2	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part – III (B.Sc. Botany)
SEMESTER –III - Allied - I
PLANT DIVERSITY AND MEDICINAL BOTANY (CABO11)
(4 hrs / week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To understand the general characters and economic importance classification and lifecycle of Algae and fungi.	PO1, PO2	PSO1, PSO2	C
CO. 2	To understand the general characters and economic importance classification and lifecycle of Lichens and Bryophytes.	PO2, PO3	PSO3, PSO4	K, C
CO. 3	To understand the general characters and economic importance classification and lifecycle of Pteridophytes and Gymnosperms.	PO2, PO3	PSO3, PSO4	K, C
CO. 4	To understand the general characters and economic importance classification and Taxonomy of Angiosperms with selected families.	PO3, PO4, PO5	PSO5, PSO6	An
CO. 5	To morphology of the useful parts and their medicinal and economic importance.	PO4, PO5	PSO6, PSO7	Ap, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E:

Evaluation

Mapping

Core – 1: PLANT DIVERSITY AND MEDICINAL BOTANY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	2	3	3	2	3	3	2	3	3	3	3	2
2	2	2	3	2	2	3	3	3	2	2	3	2
3	2	2	3	2	2	3	3	3	2	2	3	2
4	3	3	2	2	3	3	2	3	2	1	3	3
5	2	3	2	1	3	3	2	3	2	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

Semester-III /Allied Practical-I PLANT DIVERSITY AND MEDICINAL BOTANY – PRACTICAL

Sub. Code : CABOP1

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To apply the skill of identifying algae, fungi, lichen, bryophytes, pteridophytes and gymnosperms	PO1, PO2	PSO1, PSO2	U, Ap
CO. 2	Apply laboratory skills including microscopy and careful observation	PO2, PO3	PSO3, PSO4	Ap
CO. 3	Apply the knowledge to identify various families	PO2, PO3	PSO3, PSO4	U, Ap
CO. 4	Identification of medicinally important plants	PO3, PO4, PO5	PSO5, PSO6	An
CO. 5	Record the observation	PO4, PO5	PSO6, PSO7	Ap, C, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

Core – 1: PLANT DIVERSITY AND MEDICINAL BOTANY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	2	3	2	3	3	2	3	3	3	3	2
2	2	2	3	2	2	2	3	2	2	2	3	2
3	2	2	3	2	2	3	3	3	2	2	3	2
4	3	3	2	2	3	3	2	3	2	1	3	3
5	2	3	2	1	3	3	2	3	2	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021 - 2022 UG – Colleges/Part-III (B.Sc. Botany)

SEMESTER - III

SKILL BASED SUBJECT - I (B) ORGANIC FARMING

(CSBO32)

(4hrs / week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To study about the description and types of soil	PO1, PO2	PSO1, PSO2, PSO3	K, C
CO. 2	To infer about the preparation of organic manures	PO3, PO4	PSO4, PSO5	An, K
CO. 3	To sketch and illustrate the advantages of composting.	PO4	PSO4, PSO5	E
CO. 4	To criticize and realize the importance of bio-fertilizers	PO4	PSO6, PSO7	Ap, An
CO. 5	To grade and develop about the importance and preparation of vermin-composting and punchagavya	PO4, PO5	PSO6, PSO7	An, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis ; E: Evaluation

Mapping

ORGANIC FARMING												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	3	3	3	2	2	3	3	3	3	2	2
2	3	3	3	3	2	2	3	3	3	3	2	2
3	3	3	3	3	2	1	3	3	3	3	2	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part - III (B.Sc. Botany)
SEMESTER - III
NON - MAJOR ELECTIVE – I(A):GARDENING AND GARDEN MANAGEMENT
(2hrs/week) (Sub. Code :)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To study about the types of garden	PO1, PO3	PSO1, PSO2, PSO3	K
CO. 2	To realize the propagation techniques.	PO2	PSO4	C
CO. 3	To revise the components of ornamental Gardens	PO1, PO3	PSO6	Ap, K
CO. 4	Application of kitchen garden	PO4, PO5	PSO7	Ap
CO. 5	To apprehend the maintenance of indoor gardening	PO5	PSO5, PSO6, PSO7	Ap

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

GARDENING AND GARDEN MANAGEMENT												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	3	3	3	2	2	3	3	3	3	2	2
2	3	3	3	3	2	2	3	3	3	3	2	2
3	3	3	3	3	2	1	3	3	3	2	3	3
4	3	3	3	3	2	1	3	3	3	2	3	3
5	2	3	3	3	2	2	2	3	3	1	3	3

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part - III (B.Sc. Botany)
SEMESTER - III
YOGA
(2hrs/week) (Sub. Code : CYOG31)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To demonstrate basic skills associated with yoga	PO1, PO3	PSO1, PSO2, PSO3	K, Ap
CO. 2	To learn the ability to perform yoga movements in various combinations and forms	PO2	PSO4	C, An
CO. 3	To understand and apply the knowledge of learning yoga	PO1, PO3	PSO6	Ap, K, U
CO. 4	To demonstrate the ability to create and present various yoga activities	PO4, PO5	PSO7	Ap

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

YOGA													
CO/PO/PSO	PO					PSO							
	1	2	3	4	5	1	2	3	4	5	6	7	
1	2	3	3	3	3	3	3	3	3	3	2	2	2
2	3	2	3	3	2	2	3	3	3	3	2	2	2
3	2	3	3	3	2	1	3	3	3	2	3	3	3
4	3	3	3	3	2	1	3	3	3	2	3	3	3
5	2	3	3	3	2	2	2	3	3	1	3	3	3

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part - III (B.Sc. Botany) SEMESTER - IV
CORE PAPER–IV: PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY
(4 hrs / week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To explain the classification, distribution, structure, diversity inhabits, habitats , reproduction and life cycle and organization of Pteridophytes. (<i>Psilotum</i> and <i>Lycopodium</i>)	PO1, PO2	PSO1, PSO2, PSO3	K, C
CO. 2	To impart an insight into the Occurrence, Systematic Position, Structure, Reproduction and Life Cycle of gametophytes.	PO2, PO3	PSO3, PSO4	K, C
CO. 3	To argue about the General characteristics and Classification of Gymnosperms	PO1, PO2	PSO1, PSO2, PSO3	An, Ap
CO. 4	To outline the anatomical variations in Gnetum.	PO3, PO4	PSO4, PSO5, PSO6	K
CO. 5	To infer the significance of Paleobotany and its applications.	PO5	PSO6, PSO7	Ap, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	3	3	3	2	2	3	3	3	3	2	2
2	3	3	2	2	2	2	3	3	3	3	3	2
3	3	3	2	2	2	1	3	3	3	3	3	2
4	3	3	2	1	2	1	3	3	3	3	3	2
5	2	3	3	3	2	2	2	3	3	3	3	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/ 2017-18 / UG-Colleges/Part-III (B.Sc.Botany)/ Semester– III / Major Practical 4
Pteridophytes, Gymnosperms and Paleobotany
Subject Code: CMBOP4

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	Apply laboratory skills including microscopy, dissection and careful observation	PO1, PO2	PSO1, PSO2, PSO3	Ap
CO. 2	Identify the gymnosperms and paleobotanical specimen	PO2, PO3	PSO3, PSO4	U, Ap
CO. 3	Record the observation	PO1, PO2	PSO1, PSO2, PSO3	Ap, C, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	2	2	3	2	2	3	3	3	3	2	2
2	2	3	2	2	2	2	3	3	3	3	3	2
3	3	2	2	2	2	1	3	3	3	3	3	2
4	3	3	2	1	2	1	3	3	3	3	3	2
5	2	3	3	3	2	2	2	3	3	3	3	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

**MSU/ 2021-2022 UG-Colleges /Part-III (B.Sc. Botany) / / Allied -II Semester - IV
EMBRYOLOGY, PLANT ANATOMY, PHYSIOLOGY AND BIOTECHNOLOGY
(4 Hrs / Week) (CABO21)**

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To understand the structure and development of microsporangium and megasporangium and Endosperm – types.	PO1, PO2	PSO1, PSO2	C
CO. 2	To meristem - structure and classification and Primary structure of Dicot and Monocot stem and root; Structure of leaf.	PO2, PO3	PSO3, PSO4	K, C
CO. 3	To examine and analyse absorption of water and Ascent of sap and Transpiration and Photosynthesis.	PO2, PO3	PSO3, PSO4	An
CO. 4	To examine and analyse Morphology, Use as Biofertilizer and Mass cultivation	PO3, PO4, PO5	PSO5, PSO6	An
CO. 5	To appraise the Tissue Culture - Scope and importance and Nutrient media review their economic importance.	PO4, PO5	PSO6, PSO7	Ap, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

EMBRYOLOGY, PLANT ANATOMY, PHYSIOLOGY AND BIOTECHNOLOGY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	2	2	3	3	2	2	3	3	3	3	2	2
2	2	1	3	2	2	3	3	3	3	3	2	2
3	2	1	3	2	1	3	3	1	3	3	2	1
4	2	2	3	2	1	3	3	1	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation

**Allied Practical-II
PRACTICAL - II**

**EMBRYOLOGY, PLANT ANATOMY, PHYSIOLOGY AND BIOTECHNOLOGY- PRACTICAL
(Subject Code : CABOP2)**

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	Apply laboratory skills including microscopy, dissection and careful observation	PO1, PO2	PSO1, PSO2	Ap
CO. 2	Assess the anatomy of plant stem, root and leaves	PO2, PO3	PSO3, PSO4	An
CO. 3	Perform the physiological experiment in the laboratory	PO2, PO3	PSO3, PSO4	Ap, An
CO. 4	Identification of basic biotechnological processes	PO3, PO4, PO5	PSO5, PSO6	U, S
CO. 5	Record the observation	PO4, PO5	PSO6, PSO7	Ap, C, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

EMBRYOLOGY, PLANT ANATOMY, PHYSIOLOGY AND BIOTECHNOLOGY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	2	3	2	2	2	3	3	3	3	2	2
2	2	1	3	2	2	3	3	3	3	3	2	2
3	3	1	3	2	1	3	3	1	3	3	2	1
4	2	2	3	2	1	3	3	1	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation

MSU / 2021 - 2022 UG – Colleges / Part - III (B.Sc. Botany)
SEMESTER – IV SKILL
BASED SUBJECT –I (B)
PRESERVATION OF FRUITS AND VEGETABLES (CSBO42)
(4hrs/week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	Acquire basic knowledge about the nutritive values of fruits and vegetables	PO1, PO2	PSO1, PSO2	K
CO. 2	Familiarize with the basic skills in the methods of Preservation.	PO2, PO3	PSO3, PSO4, PSO5	Ap
CO. 3	Understand the Methods of preparation of Fruit Juice.	PO3, PO4	PSO5, PSO7	C
CO. 4	Understand the Preparation of Chutney, Ketchup and Drying of fruits.	PO3, PO4, PO5	PSO5, PSO6	K, C
CO. 5	To know about the canning methods.	PO5	PSO6, PSO7	K

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

PRESERVATION OF FRUITS AND VEGETABLES												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	3	3	3	2	2	3	3	2	2	2	2
2	3	3	3	3	2	2	3	3	2	2	2	2
3	3	3	3	3	2	1	3	3	2	1	2	1
4	3	3	3	3	2	1	3	3	2	1	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part - III (B.Sc. Botany)
SEMESTER – IV
NON – MAJOR ELECTIVES II - (A) FOOD AND NUTRITION
(2hrs/week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To understand the energy value of food and balanced diet.	PO1, PO2, PO3	PSO1, PSO2, PSO3	K
CO. 2	To make the students aware about the nutritive value of cereals, nuts and oil seeds.	PO2, PO3, PO4	PSO PSO2, PSO3, PSO4	K, C
CO. 3	To help students to design novel mechanisms for the sustainable utilization of naturalresources.	PO2, PO3, PO4	PSO3, PSO4, PSO5	An, Ap
CO. 4	To study about the importance of preservationand uses of oil and spices.	PO3, PO4	PSO5, PSO6	K, Ap
CO. 5	To make the students aware about food poisoning.	PO3, PO4	PSO6, PSO7	K
CO. 6	To know about the fermentation types.	PO5	PSO6, PSO7	K

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

FOOD AND NUTRITION												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	
1	3	3	2	2	2	2	3	3	3	2	2	2
2	3	3	2	1	2	2	3	3	3	2	1	2
3	3	3	2	1	2	1	3	3	3	2	1	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part - III (B.Sc. Botany)
SEMESTER – IV SKILL
BASED SUBJECT –I (B)
COMPUTERS FOR DIGITAL ERA
(2hrs/week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To demonstrate a basic understanding of computer	PO1, PO2	PSO1, PSO2	K, Ap
CO. 2	To learn the problem solving skills	PO2, PO3	PSO3, PSO4, PSO5	Ap, U
CO. 3	To apply logical skills for programming in a variety of languages	PO3, PO4	PSO5, PSO7	C, Ap

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

COMPUTERS FOR DIGITAL ERA												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	2	3	2	3	3	1	3	3	2	2	2	2
2	2	2	3	3	2	2	3	3	2	2	2	2
3	3	3	3	3	2	1	3	3	2	1	2	1
4	2	3	3	3	2	1	3	3	2	1	2	1
5	2	3	1	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part - III (B.Sc. Botany)
SEMESTER – V
CORE PAPER–V: CELL BIOLOGY AND EMBRYOLOGY OF ANGIOSPERMS
(5 HRS/WEEK)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To study the structure of Prokaryotic and Eukaryotic cells.	PO1, PO2	PSO1, PSO2, PSO3	K
CO. 2	To understand the ultrastructure of cell organelles and function.	PO1, PO2, PO3	PSO1, PSO2, PSO3	C
CO. 3	To help the students to study the Morphological nature of Flower.	PO2, PO4	PSO1, PSO2, PSO3	K, C
CO. 4	To aid the students to understand how the zygote is formed in plants.	PO1, PO2, PO3	PSO4, PSO5, PSO6	K
CO. 5	To make the students to understand about the Seed and Fruit Development.	PO4, PO5	PSO6, PSO7	K

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

CELL BIOLOGY AND EMBRYOLOGY OF ANGIOSPERMS												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	2	2	3	3	2	2	3	2	2	3	2	2
2	2	2	3	3	2	2	3	2	2	3	2	2
3	2	1	3	3	2	1	3	2	1	3	2	1
4	2	1	3	3	2	1	3	2	1	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part - III (B.Sc. Botany)
SEMESTER – V
CORE PAPER – VI: MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS
(5hrs / week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To study the morphological modifications in plants.	PO1, PO2	PSO1, PSO2, PSO3	K
CO. 2	To help the students to understand the Systems of classification of plants.	PO1, PO2, PO3	PSO1, PSO2, PSO3	K, C
CO. 3	To understand the detailed study of the following families and their economic importance: Nymphaeaceae, Annonaceae, Rutaceae, Caesalpiniaceae, Cucurbitaceae and Apiaceae.	PO1, PO2, PO3	PSO1, PSO2, PSO3	K, C
CO. 4	To study about the detailed study of the following families and their economic importance Rubiaceae, Sapotaceae, Convolvulaceae, Asclepiadaceae and Lamiaceae.	PO2, PO3, PO4, PO5	PSO3, PSO4, PSO	K, C
CO. 5	To make the students to understand detailed study of the following families and their economic importance Amaranthaceae, Euphorbiaceae, Liliaceae, Arecaceae and Poaceae.	PO2, PO3, PO4, PO5	PSO3, PSO4	Ap, An

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation.
Mapping

MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	3	3	3	2	2	3	3	3	3	2	2
2	3	3	3	3	2	2	3	3	3	3	2	2
3	3	3	3	3	2	1	3	3	3	3	2	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part - III (B.Sc. Botany)
SEMESTER – V
CORE PAPER–VII: BIOCHEMISTRY AND BIOINFORMATICS
(5hrs / week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To make the students aware about the basic chemical structure and basic instruments.	PO1, PO2	PSO1, PSO2, PSO3	K
CO. 2	To study the structure and properties of carbohydrates.	PO1, PO2, PO3	PSO1, PSO2, PSO3, PSO4	K
CO. 3	To help the students to understand the properties of proteins	PO2, PO3	PSO1, PSO2	K, C
CO. 4	To study about the basics of enzyme function and its application.	PO1, PO2, PO3	PSO1, PSO2, PSO6	K
CO. 5	To make the student's familiar with the bioinformatics tool and data bases for screening big data corresponding to the living organisms and its applications in genetic diversity, heredity and forensics. Also in the modeling of macromolecules and drug designs strategies.	PO2, PO3, PO4, PO5	PSO1, PSO5, PSO6	K, An

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis ; E: Evaluation

Mapping

BIOCHEMISTRY AND BIOINFORMATICS												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	3	2	3	2	3	2	3	3	3	2	2
2	3	3	2	3	2	3	2	3	3	3	3	2
3	3	3	2	3	2	3	2	3	3	3	3	2
4	3	3	3	3	2	1	3	3	3	3	3	2
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/ 2017-18 / UG-Colleges/Part-III (B.Sc.Botany)/ Semester– V / Major Practical 5

CELL BIOLOGY, EMBRYOLOGY, MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS
Subject Code: AMBOP5

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	Apply laboratory skills including microscopy and careful observation	PO1, PO2	PSO1, PSO2, PSO3	U, Ap
CO. 2	Apply the knowledge to identify various families	PO1, PO2, PO3	PSO1, PSO2, PSO3	K, U, Ap
CO. 3	Prepare the herbarium of medicinally important plants	PO1, PO2, PO3	PSO1, PSO2, PSO3	Ap, An
CO. 4	To prepare stages of ovule	PO2, PO3, PO4, PO5	PSO3, PSO4, PSO	Ap
CO. 5	Record the observation	PO2, PO3, PO4, PO5	PSO3, PSO4	E, C, An

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation.

Mapping

CELL BIOLOGY, EMBRYOLOGY, MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	2	3	2	3	2	2	3	3	1	3	2	2
2	3	2	3	3	2	2	3	3	3	3	2	2
3	2	3	3	3	2	1	3	3	3	3	2	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

**MSU/ 2017-18 / UG-Colleges/Part-III (B.Sc.Botany)/ Semester– V / Major Practical 6
BIOCHEMISTRY, BIOINFORMATICS AND ELECTIVE I (AMBOP6)**

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To perform the biochemical experiment in the laboratory	PO1, PO2	PSO1, PSO2, PSO3	Ap
CO. 2	To demonstrate the experiment	PO1, PO2, PO3	PSO1, PSO2, PSO3, PSO4	An
CO. 3	To dissect the plants and to identify their adaptation techniques	PO2, PO3	PSO1, PSO2	Ap, An
CO. 4	To know about vegetation types and identification of plants in the particular area	PO1, PO2, PO3	PSO1, PSO2, PSO6	K, Ap

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis ; E: Evaluation

Mapping

BIOCHEMISTRY, BIOINFORMATICS & ELECTIVE I												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	3	3	3	3-+	3	2	3	3	3	2	2
2	3	3	2	3	2	3	2	3	3	3	3	2
3	3	3	2	3	2	3	2	3	3	3	3	2
4	3	3	3	3	2	1	3	3	3	3	3	2
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part - III (B.Sc. Botany) SEMESTER – V
ELECTIVE I (A) - PLANT ECOLOGY AND
PHYTOGEOGRAPHY
(5hrs/week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To enable the students to understand biotic and abiotic factors in various ecosystems and vegetation.	PO1, PO2	PSO1, PSO2, PSO3, PSO4	K
CO. 2	To study the concept and types of ecosystem and adaptations	PO1, PO2, PO4	PSO1, PSO6, PSO7	K
CO. 3	To help the students to analyze the vegetation by quadrant method	PO2, PO4	PSO1, PSO2, PSO5, PSO6	An
CO. 4	To study about the Biosensors and Bio indicators.	PO2, PO4, PO5	PSO1, PSO2, PSO3	K, C
CO. 5	Make the students to understand the principles of continental drift and endemism and to know about the vegetation in Tamil Nadu and uses of Remote Sensing.	PO2, PO4, PO5	PSO6, PSO7	An, Ap

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis ; E: Evaluation

Mapping

PLANT ECOLOGY AND PHYTOGEOGRAPHY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	2	3	3	2	2	3	3	3	2	2	2
2	3	2	3	3	2	2	3	3	3	2	2	2
3	3	2	3	3	2	1	3	3	3	2	2	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part - III (B.Sc. Botany)
SEMESTER – V
SKILL BASED – PERSONALITY DEVELOPMENT
(4hrs / week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To develop and exhibit an accurate sense of self	PO1, PO2	PSO1, PSO2, PSO3	K, C
CO. 2	To develop and nurture a deep understanding of personal motivation	PO1, PO2, PO3	PSO1, PSO2, PSO3	K, C
CO. 3	To develop an understanding of and practice personal and professional responsibility	PO1, PO2, PO3	PSO1, PSO2, PSO3	K, C, U

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation.

Mapping

PERSONALITY DEVELOPMENT												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	2	2	3	1	2	1	3	3	2	3	3	2
2	3	3	3	3	2	2	3	3	3	3	2	2
3	1	3	3	3	2	1	3	3	3	3	2	1
4	3	3	3	3	2	1	2	3	2	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part – III (B.Sc. Botany)
SEMESTER - VI
CORE PAPER–VIII - GENETICS, EVOLUTION AND BIOSTATISTICS
(5 hrs / week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To impart an insight into the principles of heredity and the mendelian concepts.	PO1, PO2, PO4	PSO1, PSO2, PSO3	An, C
CO. 2	To understand the patterns of inheritance in different organisms and the modes of linkages and crossing over.	PO1, PO2, PO4	PSO, PSO2, PSO3, PSO4	K
CO. 3	To study about the basics of genetic material and their expression in the determination of sex and other characteristics.	PO2, PO4, PO5	PSO1, PSO2, PSO3, PSO4	K
CO. 4	To contrast and relate the theory of evolution and its applications.	PO4, PO5	PSO6	Ap, An
CO. 5	To develop skills in biostatistics and its applications.	PO3, PO4, PO5	PSO3, PSO4	S, An

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

GENETICS, EVOLUTION AND BIOSTATISTICS												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	2	2	3	3	2	2	3	3	2	2	2
2	3	2	1	3	3	2	1	3	3	2	1	2
3	3	2	1	3	3	2	1	3	3	2	1	1
4	3	2	2	3	3	2	2	3	3	2	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part – III (B.Sc. Botany)
SEMESTER - VI
CORE PAPER – IX: PLANT PHYSIOLOGY
(5hrs / week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To understand the relationship between water and plant cells.	PO1, PO2	PSO1, PSO2, PSO3, PSO4	C
CO. 2	To transport water and food materials throughout the body of the plant.	PO1, PO2	PSO1, PSO2, PSO3	C
CO. 3	To study about the various pathways for training to the photosynthetic activity and respiration.	PO3, PO4, PO5	PSO1, PSO2, PSO3, PSO4, PSO5, PSO6	K, An
CO. 4	To understand in detail about the growth of the plant and the influence of plant growth regulators on its growth.	PO2, PO3, PO4	PSO1, PSO2, PSO4, PSO5, PSO6	An, Ap
CO. 5	To know about the sea dormancy its application and photo periodic effects.	PO2, PO4	PSO1, PSO2, PSO3, PSO4, PSO5, PSO6	K, C

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

PLANT PHYSIOLOGY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	3	2	3	3	3	2	3	3	3	2	2
2	3	3	2	3	3	3	2	3	3	3	2	2
3	3	3	2	3	3	3	2	3	3	3	2	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part – III (B.Sc. Botany)
SEMESTER – VI
CORE PAPER – X: MICROBIOLOGY
(4 Hrs / Week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To understand the history of microbiology bacterial classification culture of bacteria and its predictive techniques.	PO1, PO2, PO4	PSO1, PSO2, PSO3, PSO4	C
CO. 2	To study about virus, virions prions and why rights and their diseases in plants.	PO1, PO2, PO4	PSO5, PSO6	K
CO. 3	To know about the importance of microbes in food as well as their pathogenic effects	PO3	PSO1, PSO2, PSO3, PSO5, PSO6	K, Ap
CO. 4	To realize the need for gene transfer and its mechanism; also to know about different microscopy and its techniques.	PO4, PO5	PSO2, PSO3, PSO4	An, E
CO. 5	To know about identification of recombinants marker systems and blotting techniques.	PO2, PO4, PO5	PSO3, PSO4, PSO5, PSO6	K, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis ; E: Evaluation

Mapping

MICROBIOLOGY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	3	3	3	2	2	3	3	3	3	2	2
2	3	3	3	3	2	2	3	3	3	3	2	2
3	3	3	3	3	2	1	3	3	3	3	2	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part – III (B.Sc. Botany)
SEMESTER - VI
ELECTIVE PAPER – 1 (A): HORTICULTURE & PLANT
BREEDING
(4hrs/week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To know about the different types of horticulture and its uses.	PO1, PO2	PSO1, PSO2, PSO3, PSO4	K
CO. 2	To understand different propagation techniques and its steps and procedure.	PO1, PO2, PO4	PS1, PSO2, PSO3, PSO4, PSO5	C
CO. 3	To learn and work with the different garden tools and components	PO1, PO2, PO4	PSO2, PSO4, PSO5, PSO6	K
CO. 4	To Realize and revitalize the hybridization techniques both in theory and practical	PO3, PO4, PO5	PSO2, PSO4, PSO5, PSO6	E, An
CO. 5	To apply mutation in the breeding of plants and to create various resistant varieties	PO3, PO4, PO5	PSO2, PSO4, PSO5, PSO6	Ap

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

HORTICULTURE & PLANT BREEDING												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	2	2	3	2	2	3	3	2	2	2	2
2	3	2	1	3	2	2	3	3	2	1	2	2
3	3	2	1	3	2	1	3	3	2	1	2	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU / 2021 - 2022 UG – Colleges / Part – III (B.Sc. Botany)
SEMESTER - VI
ELECTIVE PAPER - II (B):
ENVIRONMENTAL BIOTECHNOLOGY
(4hrs / week)

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To know about the aim and scope of environmental technology and application of biotechnological methods to bio remediate the present environment	PO1, PO2, PO3, PO4	PSO1, PSO2, PSO3, PSO4	K, C
CO. 2	To know and understand in detail about the biofuels and its production	PO2, PO3	PSO1, PSO2, PSO3, PSO4	K, C
CO. 3	To evaluate the successful treatment of sewage through biotechnology.	PO2, PO4, PO5	PSO1, PSO2, PSO3, PSO4	E
CO. 4	To study about the solid waste treatment and in detail about bioremediation.	PO1, PO4, PO5	PSO2, PSO3, PSO5, PSO6	K
CO. 5	To know in detail about the greenhouse effects and remote sensing techniques.	PO1, PO4, PO5	PSO2, PSO3, PSO5, PSO6	K

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

ENVIRONMENTAL BIOTECHNOLOGY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	3	3	3	3	2	2	3	3	3	3	2	2
2	3	3	3	3	2	2	3	3	3	3	2	2
3	3	3	3	3	2	1	3	3	3	3	2	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/ 2017-18 / UG-Colleges/Part-III (B.Sc.Botany)/ Semester– VI / Major Practical 7

GENETICS, EVOLUTION AND BIOSTATISTICS & ELECTIVE I

Subject Code: SMBOP7

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To perform standard deviation	PO1, PO2	PSO1, PSO2, PSO3, PSO4	K, Ap
CO. 2	To apply the formulas to calculate mean, median and other genetic problems	PO1, PO2, PO4	PS1, PSO2, PSO3, PSO4, PSO5	C, Ap
CO. 3	To learn and work with the different garden tools and components	PO1, PO2, PO4	PSO2, PSO4, PSO5, PSO6	K, Ap
CO. 4	To Realize and revitalize the hybridization techniques	PO3, PO4, PO5	PSO2, PSO4, PSO5, PSO6	E, An
CO. 5	To apply mutation in the breeding of plants and to create various resistant varieties	PO3, PO4, PO5	PSO2, PSO4, PSO5, PSO6	Ap

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

GENETICS, EVOLUTION, BIOSTATISTICS & ELECTIVE I												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	2	3	2	3	2	3	3	2	3	3	2	2
2	3	3	3	3	2	2	3	3	3	3	2	2
3	3	3	3	3	2	1	3	3	3	3	2	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/ 2017-18 / UG-Colleges/Part-III (B.Sc.Botany)/ Semester– VI / Major Practical 8

PLANT PHYSIOLOGY

Subject Code: AMBOP8

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To perform the physiological experiment in the laboratory	PO1, PO2	PSO1, PSO2, PSO3, PSO4	K, Ap
CO. 2	To understand different functions and the adaptations owned by the plants	PO1, PO2, PO4	PS1, PSO2, PSO3, PSO4, PSO5	C, Ap
CO. 3	To record the observation	PO1, PO2, PO4	PSO2, PSO4, PSO5, PSO6	K, An, E

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

PLANT PHYSIOLOGY												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	2	3	3	2	2	2	3	3	3	3	2	2
2	3	2	2	3	2	2	3	3	3	3	2	2
3	2	3	3	3	2	1	3	3	3	3	2	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/ 2017-18 / UG-Colleges/Part-III (B.Sc.Botany)/ Semester– VI / Major Practical 9

MICROBIOLOGY & ELECTIVE II

Subject Code: AMBOP9

CO. NO	Description	PO Addressed	PSO Addressed	CL
CO. 1	To make the students learn about serial dilution for the isolation of bacteria	PO1, PO2	PSO1, PSO2, PSO3, PSO4	K, Ap
CO. 2	To understand different streaking methods	PO1, PO2, PO4	PS1, PSO2, PSO3, PSO4, PSO5	C, Ap
CO. 3	To identify whether the bacteria as positive or negative	PO1, PO2, PO4	PSO2, PSO4, PSO5, PSO6	K, Ap

K: Knowledge; C: Comprehension; Ap: Application; An: Analysis; S: Synthesis; E: Evaluation

Mapping

MICROBIOLOGY & ELECTIVE II												
CO/PO/PSO	PO					PSO						
	1	2	3	4	5	1	2	3	4	5	6	7
1	2	3	2	3	2	2	3	3	3	3	2	2
2	3	2	3	3	2	2	3	3	3	3	2	2
3	2	3	3	3	2	1	3	3	3	3	2	1
4	3	3	3	3	2	1	3	3	3	3	2	1
5	2	3	3	3	2	2	2	3	3	3	2	2

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

