M.Sc. Botany (2020 – 2022)
M.Sc. Botany Programme Outcomes (POs)

PO No.	Upon completion of M.Sc. Degree Programme, the graduates will be able to :
PO – 1	carry out internship programmes and research projects to develop scientific skills and innovative ideas
PO – 2	analyse complex problems, think independently, formulate and perform quality research
PO – 3	become successful professionals and entrepreneurs
PO – 4	develop a multidisciplinary perspective and contribute to the knowledge capital of the globe
PO – 5	emerge as expressive, ethical and responsive citizens with proven expertise
PO – 6	utilize the obtained scientific knowledge to create eco- friendly environment

Programme Educational Objectives (PEOs)

PEO No.	Upon completion of M.Sc. Degree Programme ,the graduates will be able to:
PEO-1	The graduates will apply appropriate theory and scientific knowledge to participate in activities that support humanity and economic development nationally and globally, developing as leaders in their fields of expertise.
PEO-2	The graduates pursue lifelong learning and continuous improvement of the knowledge and skills with the highest professional and ethical standards.
PEO-3	The graduates will develop strong and competent knowledge with diversified professional skills in accordance with dynamic real–time challenges and career opportunities.

M.Sc. Botany Programme Specific Outcomes (PSOs)

PSO No.	Upon completion of M.Sc. Degree Programme, the graduates of Botany will be able to:	PO Addressed
PSO – 1	apply fundamental mathematical tools and physical principles in analysing biological situations	PO – 2
PSO – 2	evaluate ecological interconnectedness of life on earth	PO – 4, 6
PSO - 3	experience in seeking external funds for their research from a diversity of resources	PO – 1, 2
PSO – 4	apply the acquired conceptual knowledge by connecting disciplinary and interdisciplinary aspects of Botany	PO – 4
PSO – 5	integrate the knowledge of botany for global sustainable development	PO – 3, 4
PSO – 6	understand the professional, ethical, legal and social issues related to gender	PO – 3, 5

Course Outcomes (Cos)

Semester : **I** **Major Core I**

Name of the Course : **Plant Diversity I - Algae, Fungi, Lichens and Bryophytes**

Subject Code : **PB2011**

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	remember the basic concepts of plant diversity	PSO – 4	R
CO - 2	understand the morphological diversity of thallophytes	PSO – 3	U
CO - 3	evaluate the life history of different thallophytic members	PSO – 2	E
CO - 4	analyze the thallophytes found in water bodies	PSO – 2	An
CO - 5	create a protocol to assess the role of thallophytes with industrial applications	PSO – 3	C
CO - 6	apply the knowledge attained from evolutionary aspects of plant diversity towards research	PSO – 6	Ap

Semester : I **Major Core II**

Name of the Course : Microbiology

Subject Code : PB2012

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	understand the basic concepts of microbiology and immunology	PSO – 1	U
CO - 2	remember the classification and nomenclature of microorganisms and plant diseases	PSO – 4	R
CO - 3	apply modern techniques to detect antigen, antibodies, pathogens and its controlling measures	PSO –5	Ap
CO - 4	evaluate the role of antimicrobial drugs and its resistance	PSO – 5	E
CO - 5	analyze the microbes present in milk, water, soil and plants	PSO – 4	An
CO - 6	create a protocol for identification of gram positive and gram negative bacteria	PSO - 3	C

Semester : I **Major Core III**

Name of the Course : Plant Anatomy and Embryology

Subject code : PB2013

CO	Upon completion of this course the students will be able to :	PSO addressed	CL

CO - 1	understand the characteristics of specialized cells and their components	PSO – 4	U
CO - 2	remember the knowledge of plant cells , tissues and functional theories	PSO – 5	R
CO - 3	analyze the structural differences among different taxa of vascular plants	PSO – 3	An
CO - 4	apply the knowledge of anatomical studies in different field	PSO – 1	Ap
CO - 5	evaluate the nature and secret of seed development	PSO – 2	E

Semester : I **Elective I(a)**

Name of the Course : Marine Biology

Subject code : PB2014

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	Understand the basic characteristics and biological processes of marine habitat	PSO – 4	U
CO – 2	remember the diversity of marine habitat	PSO – 2	R
CO – 3	create a protocol for producing useful products by cultivating marine organisms	PSO – 3	C
CO – 4	analyse the different types of pollution in marine environment	PSO – 2	An
CO – 5	apply different techniques to identify bioactive compounds	PSO – 4	Ap
CO – 6	evaluate the inter-relationships of mangroves, sea grasses, corals and salt marsh plants	PSO – 2	E

Semester : I **Elective I (b)**

Name of the Course : Organic Farming

Sub. Code : PB2015

CO No.	Upon completion of this course the students will be able to:	PSO addressed	CL
CO – 1	understand the role of micro and macro nutrients in plant growth and development	PSO – 4	U
CO – 2	remember the principles of organic and ecological approaches in agriculture	PSO – 5	R
CO – 3	analyse the soil types, agricultural waste and nature of pests in fields	PSO – 4	An
CO – 4	create organic farming and gardening methods that sustain profitableproduction, and environmental health.	PSO – 2	C

Semester : I Practical I

Name of the Course : Practical I - Plant Diversity I – Algae, Fungi, Lichens and Bryophytes, Microbiology and Plant Anatomy & Embryology

Sub. Code : PB20P1

CO No:	Expected Learning Outcomes Upon completion of this course, the students will be able to:	PSO Addressed	CL
CO - 1	understand the thallophytes by micropreparation	PSO – 4	U
CO - 2	analyze the cryptogams on the basis of morphological characters	PSO – 1	An
CO - 3	evaluate the methodology to differentiate gram positive and gram negative bacteria	PSO –2	E
CO - 5	apply the knowledge of anatomical studies in research	PSO –3	Ap
CO - 6	evaluate the nature and defects of wood	PSO – 2	E

Semester : **II** **Major Core IV**

Name of the Course : **Plant Diversity II -Pteridophyta, Gymnosperms and Palaeobotany**

Subject code : **PB2021**

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	understand the life cycle and major evolutionary trends of non – flowering plants	PSO - 1	U
CO - 2	remember, recognize and identify the non – flowering plants	PSO –2	R
CO - 3	analyze the inter - relationship between Pteridophytes and Gymnosperms	PSO – 2	An
CO - 4	evaluate and compare the evolution of gametophytes and sporophytes of Pteridophytes	PSO – 5	E
CO - 5	apply the knowledge attained from evolutionary aspects of plant diversity towards research	PSO – 3	Ap
CO - 6	create methods to extract, prepare, preserve and catalogue fossils	PSO – 3	C

Semester : **II** **Major Core V**

Name of the Course : **Research Methodology**

Subject code : **PB2022**

CO	Upon completion of this course the students will	PSO	CL

	be able to :	addressed	
CO - 1	remember the basic concepts of research and its methodologies	PSO – 4	R
CO - 2	understand the principles and working mechanisms of various instruments	PSO – 5	U
CO - 3	apply computer skills in research	PSO – 3	Ap
CO - 4	analyze the biological data in solving biological problems	PSO –1	An
CO - 5	create skills in qualitative and quantitative data analysis and presentation	PSO – 3	C

Semester : II Major Core VI

Name of the Course : Cell Biology and Biomolecules
Subject code : PB2023

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	understand the diversity of cells and the role of compartmentalization and cell signaling	PSO - 4	U
CO - 2	remember the role of inorganic and organic molecules to life	PSO –2	R
CO - 4	understand the structure and functions of different biomolecules	PSO –4	U
CO - 5	apply the basic principles and concepts of enzyme regulation	PSO – 5	Ap
CO - 6	analyze the modern techniques in cellular biology	PSO – 3	An

Semester : II Elective II(a)

Name of the Course : Herbalism
Subject code : PB2024

CO No:	Upon completion of this course the students will be able to:	PSO Addressed	CL
CO - 1	remember the traditional systems of medicines in terms of Siddha, Ayurvedha, and Unani	PSO – 6	R
CO - 2	understand the conservation of medicinal plants –*in situ* and *ex situ*	PSO – 5	U
CO - 3	apply the methods that extract oil from *Eucalyptus*, *Cymbopogon*, Rose, and *Santalum*	PSO – 3	Ap
CO - 4	create the protocol for extracting withanolides, hyoscyamine and vinblastine.	PSO – 1	C
CO - 5	analyze crude drugs both qualitatively and quantitatively	PSO – 4	An

Semester : II **Elective II (b)**

Name of the Course : Evolutionary Biology

Sub. Code : PB2025

CO No:	Course Outcomes Upon completion of this course, students will be able to	PSO Addressed	CL
CO - 1	analyze the major genetic and ecological processes underlying evolution and selection	PSO – 2	An
CO - 2	remember the theory of evolution considering Darwinism and Modern Synthetic Theory	PSO – 4	R
CO - 3	understand the population genetic consequences of selection	PSO –5	U
CO - 4	create evolutionary hypotheses for a wide variety of biological phenomena	PSO - 1	C
CO - 5	apply evolutionary principles in research	PSO - 2	Ap

Semester : **Practical II**

Name of the Course : **Practical II - Plant Diversity II- Pteridophyta, Gymnosperms and Palaeobotany, Research Methodology and Cell Biology and Biomolecules**

Sub. Code : **PB20P2**

CO No:	Upon completion of this course, the students will be able to:	PSO Addressed	Cognitive level
CO - 1	understand vascular cryptogams by micropreparation	PSO –4	U
CO - 2	analyse Pteridophytes and Gymnosperms based on their anatomical features	PSO – 2	An
CO - 4	evaluate macromolecules in biological samples	PSO – 3	E
CO – 5	analyze different biological data using biostatistics	PSO –1	An

Semester : **III** **Major Core VII**

Name of the Course : **Taxonomy of Angiosperms**

Subject code : **PB2031**

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	differentiate between natural and artificial system of classification	PSO – 2	U
CO - 2	apply sketches to identify the flora	PSO – 5	Ap
CO - 3	collect and prepare herbaria for future use	PSO – 4	C
CO - 4	record the rules and regulations framed by ICBN	PSO – 2	R
CO - 5	interpreting biological knowledge in	PSO – 3	An

	comparing and ranking plants		
CO - 6	evaluation of plants by using dichotomous keys	PSO – 5	E

Semester : III Major Core VIII

Name of the Course ; Genetics and Molecular Biology

Subject code ; PB2032

CO	**Upon completion of this course the students will be able to :**	**PSO addressed**	**CL**
CO - 1	understand the organization of cell organelles and genes	PSO – 2	U
CO - 2	differentiate between mitochondrial DNA and chloroplast DNA	PSO – 6	U
CO - 3	evaluate the dissociation and re - association kinetics of DNA	PSO – 6	An
CO - 4	construct different types of plasmids and operons	PSO – 2	C
CO - 5	analyze Transcription and Translation of Prokaryotes and Eukaryotes	PSO – 5	An
CO - 6	evaluate the problems in genetics	PSO – 6	E

Semester : III Major Elective III (a)

Name of the Course : Horticulture

Course Code : PB2033

CO	Upon completion of this course the students will be able to:	PSO Addressed	CL
CO - 1	categorize the propagation of horticultural crops	PSO – 2	An
CO - 2	describe orchard cultivation	PSO – 5	U
CO - 3	design a kitchen garden in growing vegetables and greens	PSO – 3	C
CO - 4	state the importance and principles of lawns, topiary and pergolas	PSO – 5	R
CO - 5	understand the methods involved in hybridization	PSO – 3	U
CO - 6	evaluate the molecular approaches for crop improvement	PSO – 2	E

Semester : III **Elective III (b)**

Name of the Course : Forestry

Subject code : PB2034

CO	Upon completion of this course the students will be able to:	PSO Addressed	CL
CO - 1	categorize the types of forests in Tamilnadu	PSO – 3	An
CO - 2	identify the reasons for degradation of forest	PSO – 2	R
CO - 3	summarize the methods in managing and conserving the forest	PSO – 5	AP
CO - 4	understand the objectives, advantages and disadvantages of agroforestry	PSO – 3	U
CO - 5	determine the role of botanical gardens, zoos, national parks, and sanctuaries	PSO – 6	U
CO - 6	evaluate the utilization of forest	PSO – 3	E

Semester : III

Name of the Course : Practical III – Taxonomy of Angiosperms, Genetics and Molecular Biology

Subject Code : PB20P3

CO	Expected Learning Outcomes Upon completion of this course,the students will be able to:	PSO Addressed	CL
CO - 1	isolate the DNA from plant materials	PSO – 4	Ap
CO - 2	separation of biomolecules using spectrophotometry	PSO – 1	Ap
CO - 3	analyse the floral parts and relate to its corresponding family	PSO –5	An
CO - 4	solve genetics related problems	PSO – 1	E

Semester : III

Name of the course : Project

Course Code PB20PR

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO - 1	explore new areas of research in Botany and allied field of life science.	PSO - 1	Ap
CO - 2	analyze a research problem and construct tools for data collection.	PSO - 2	An
CO - 3	write research reports and present results in the scientific community.	PSO - 3	Ap
CO - 4	develop skills to serve in Life science related industries and agencies.	PSO - 3	E
CO - 5	develop skills to publish articles in reputed journals.	PSO - 4	C

Semester : IV Major Core IX

Name of the Course : Plant Physiology

Subject Code : PB2041

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	relate the physical and chemical process occurring in plants	PSO – 2	R
CO - 2	understand the molecular and metabolic mechanisms of plants	PSO – 1	U
CO - 3	generalize a minor research using their theory knowledge	PSO – 5	Ap
CO - 4	examine, compare and conclude the stressed and stress free plants	PSO – 3	An
CO - 5	measure the biological mechanisms that takes place inside the plants	PSO – 2	E
CO - 6	design a protocol for plant regeneration under aseptic condition.	PSO – 4	C

Semester : IV **Major Core X**

Name of the Course : Plant Ecology and Phytogeography

Subject Code : PB2042

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	understand the scope and importance of ecosystem	PSO – 3	U
CO - 2	distinguish the difference between hydrosere and xerosere	PSO – 2	An
CO - 3	list out the various food chains in ecosystem	PSO – 1	R
CO - 4	implement the mode of studying vegetation	PSO – 4	Ap

CO - 5	understand the importance of conservation strategies	PSO – 5	U

Semester : **IV** **Major Core XI**

Name of the Course : **Biotechnology and Bioinformatics**

Subject Code : **PB2043**

CO	**Upon completion of this course the students will be able to :**	**PSO addressed**	**CL**
CO - 1	understand the importance of biotechnology and design a plant tissue culture laboratory	PSO – 3	U
CO - 2	differentiate batch, continuous and fed batch culture	PSO – 4	An
CO - 3	evaluate the pros and cons of Transgenic plants	PSO – 6	E
CO - 4	recall the different aspects of pharmaceuticals	PSO – 5	R
CO - 5	apply different databases in biological sciences	PSO – 1	Ap

Semester : **IV** **Elective IV(a)**

Name of the Course : **Phytochemistry and Pharmacognosy**

Subject Code ; **PB2044**

CO	**Upon completion of this course the students will be able to:**	**PSO Addressed**	**CL**
CO - 1	classify and understand secondary metabolites in plants	PSO – 5	U
CO - 2	remember the traditional systems of medicines in terms of Siddha, Ayurvedha, and Unani	PSO – 6	R
CO - 3	apply phytochemistry in different industries	PSO – 3	Ap

CO - 4	create the protocol for healing procedures in ethnobotany	PSO – 1	C
CO - 5	analyze crude drugs both qualitatively and quantitatively	PSO – 4	An

Semester : IV Major Elective IV(b)

Name of the Course : Entrepreneurial Botany

Course Code : PB2045

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	create protocol for the production of mushroom	PSO – 1	C
CO - 2	understand the nutritive value of SCP	PSO – 4	U
CO - 3	justify the impact of organic fertilizers over synthetic fertilizers	PSO – 5	E
CO - 4	summarize the aesthetic sense of gardening	PSO – 6	U
CO - 5	know the different funding agencies	PSO – 3	R

Semester : IV Practical IV

Name of the Course : Practical IV – Plant Physiology, Plant Ecology & Phytogeography andBiotechnology & Bioinformatics

Course Code : PB20P4

CO	Expected Learning Outcomes Upon completion of this course, the students will be able to:	PSO Addressed	CL
CO - 1	analyze DO, BOD and COD of water	PSO – 2	An

CO - 2	prepare tissue culture media, initiate callus culture, anther culture, pollen culture, etc	PSO – 4	Ap
CO - 3	identification of phytoplanktons in water bodies	PSO – 5	U
CO - 4	evaluate the metabolic reactions in plants	PSO – 4	E
CO - 5	report on common environmental problems, their consequences and possible solutions	PSO –2	E