

Department of Botany

M.Sc. Courses Offered

2017 – 2020

Semester	Subject Code	Name of the Course	Hours / week
I	PB1711	Core I - Plant Diversity I – Algae, Fungi, Lichens and Bryophytes	6
	PB1712	Core II – Microbiology, Immunology and Plant Pathology	6
	PB1713	Core III – Developmental Botany	6
	PB1714	Elective I – (a) Marine Biology / (b) Cell Biology	6
	PB17P1	Practical I - Plant Diversity I – Algae, Fungi, Lichens and Bryophytes, Microbiology, Immunology and Plant Pathology and Developmental Botany	6
II	PB1721	Core IV –Plant Diversity II - Pteridophyta, Gymnosperms and Palaeobotany	6
	PB1722	Core V – Research Methodology	6
	PB1723	Core VI – Biochemistry and Biophysics	6
	PB1724	Elective II – (a) Medicinal Botany and Pharmacognosy / (b) Medicinal Plants and Ethnobotany	6
	PB17P1	Practical I - Plant Diversity I – Algae, Fungi, Lichens and Bryophytes, Microbiology, Immunology and Plant Pathology and Developmental Botany	-
	PB17P2	Practical II - Plant Diversity II - Pteridophyta, Gymnosperms and Palaeobotany, Research Methodology and Biochemistry and Biophysics	6
	LST172	Life Skill Training (LST) – I	-
III	PB1731	Core VII - Taxonomy of Angiosperms and Economic Botany	6
	PB1732	Core VIII – Genetics and Molecular Biology	6
	PB1733	Elective III – (a) Forestry / (b) Horticulture and Plant Breeding	6
	PB17P3	Practical III - Taxonomy of Angiosperms and Economic Botany, Genetics and Molecular Biology	4
	PB17PR	Project	8
IV	PB1741	Core IX - Plant Physiology and Metabolism	6
	PB1742	Core X – Environment and Conservation	6

	Biology		
PB1743	Core XI – Applied Biotechnology		6
PB1744	Elective IV – (a) Industrial Microbiology (b) Biostatistics and Bioinformatics		6
PB17P3	Practical III - Taxonomy of Angiosperms and Economic Botany, Genetics and Molecular Biology		-
PB17P4	Practical IV - Plant Physiology and Metabolism, Environment and Conservation Biology and Applied Biotechnology		6
LST174	Life Skill Training (LST) – II		-
STP171	Summer Training Programme		-

M.Sc. Programme Outcome (POs)

PO No.	Upon completion of M.Sc. Degree Programme, the graduates will be able to :
PO - 1	Recognize the scientific facts behind natural phenomena.
PO - 2	Relate the theory and practical knowledge to solve the problems of the society.
PO - 3	Prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms
PO - 4	Face and succeed in high level competitive examinations like NET, GATE and TOFEL.
PO - 5	Carry out internship programme and research projects to develop scientific skills and innovative ideas.
PO - 6	Utilize the obtained scientific knowledge to create eco - friendly environment.
PO - 7	Prepare expressive, ethical and responsible citizens with proven expertise

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	Explicate the role of microbes – friend and foe	PO - 1
PSO - 2	Apply fundamental mathematical tools and physical principles in analysing biological situations	PO - 4
PSO - 3	Evaluate ecological interconnectedness of life on earth	PO - 1
PSO - 4	Integrate theoretical and practical knowledge to develop new drugs	PO - 2
PSO - 5	Experience in seeking external funds for their research from a diversity of resources	PO - 5
PSO - 6	Apply the acquired conceptual knowledge by connecting disciplinary and interdisciplinary aspects of Botany	PO - 6
PSO - 7	Pursue independent study and demonstrate awareness for lifelong learning and professional development	PO - 3
PSO - 8	Integrate the knowledge of botany in a global, economic, environmental, and societal context for sustainable development	PO - 6
PSO - 9	Use the techniques, skills and modern technology necessary to communicate effectively with professional and ethical responsibility	PO - 7

Course Outcomes (COs)

Semester : **I** **Major Core I**
Name of the Course : **Plant Diversity I – Algae, Fungi, Lichens and Bryophytes**
Subject code : **PB1711**

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	Identify the algae found in water bodies	PSO – 3	R
CO - 2	Understand the importance of different groups of thallophytes and their diversity	PSO – 3	U
CO - 3	Interpret the life history of different thallophytic members	PSO – 6	AP
CO - 4	Evaluate the immense role of algae to human	PSO – 4	E
CO - 5	Detect the phytochemicals in thallophytes	PSO – 5	An
CO - 6	Prepare herbarium for algae	PSO – 9	C

Semester : **I** **Major Core II**
Name of the Course : **Microbiology, Immunology and Plant Pathology**
Subject code : **PB1712**

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	Understand the basic structure and growth techniques of different microorganisms	PSO – 1	U
CO - 2	Apply some modern techniques to detect antigen and antibodies.	PSO – 2	Ap
CO - 3	Identify and treat the pathogens on economically important plants	PSO – 3	R
CO - 4	Evaluate the role of antimicrobial drugs and its resistance	PSO – 4	E
CO - 5	Analyze the bacteria present in milk, soil and water.	PSO – 9	An
CO - 6	Construct a protocol for identification of Gram positive and Gram negative bacteria	PSO - 1	C

Semester : **I** **Major Core III**
Name of the Course : **Developmental Botany**
Subject code : **PB1713**

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	Understand an over view of the basic concepts of developmental botany	PSO – 3	U
CO - 2	Determine the phylogenetic trends and specialization of xylem and phloem	PSO – 8	U
CO - 3	Describe the anomalous secondary growth in <i>Bougainvillea</i> , <i>Bignonia</i> , <i>Achyranthes</i> , and <i>Dracaena</i>	PSO – 8	U
CO - 4	Analyze the properties of wood	PSO – 2	An
CO - 5	Categorize the types of embryo sac	PSO – 5	An
CO - 6	Understand the barriers of fertilization	PSO – 3	U
CO - 7	Explain the structural changes in seed development	PSO – 6	U

Semester : **I** **Elective I (a)**
Name of the Course : **Marine Biology**
Subject code : **PB1714**

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	Understand the potentiality of marine diversity	PSO – 1	U
CO - 2	Recall the usage of different marine products	PSO – 5	R
CO - 3	Construct a protocol for sampling and cultivating marine organisms	PSO – 5	C
CO - 4	Analyse the different types of pollution in marine environment	PSO – 8	An
CO - 5	Detect different bioactive compounds from marine organisms	PSO – 4	An
CO - 6	Relate the structure, reproduction and ecological roles of mangroves, sea grasses, corals and salt marsh plants	PSO – 3	Ap

Semester : **I** **Elective I (b)**
Name of the Course : **Cell Biology**
Subject code : **PB1714**

CO No.	Upon completion of this course the students will be able to:	PSO addressed	CL
CO - 1	Relate various cell cycles in cell organelles	PSO – 2	Ap
CO - 2	Apply laws of thermodynamics in biological systems	PSO – 2	Ap
CO - 3	Understand the principle and types of biosensor	PSO – 9	U
CO - 4	Compare the genome organization of chloroplast and mitochondria	PSO – 6	E
CO - 5	Practice the technical use of different modern instruments	PSO – 5	C

Semester : **II** **Major Core IV**
Name of the Course : **Plant Diversity II - Pteridophyta, Gymnosperms and Palaeobotany**
Subject code : **PB1721**

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 - 2	U
CO - 2	Recognize and identify the non – flowering plants	PSO –3	R
CO - 3	Analyze the phylogenetic inter - relationship between Pteridophytes and Gymnosperms	PSO – 3	An
CO - 4	Compare the evolution of gametophytes and sporophytes of Pteridophytes	PSO – 8	An
CO - 5	Determine the geological age of fossils	PSO – 5	Ap
CO - 6	Collect the fossils and record their habits	PSO – 5	C

Semester : **II** **Major Core V**
Name of the Course : **Research Methodology**
Subject code : **PB1722**

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	Understand some basic concepts of research and its methodologies	PSO – 2	U
CO - 2	Define appropriate research problem and parameters	PSO – 2	R
CO - 3	Organize and conduct research systematically	PSO – 5	C
CO - 4	Apply computer skills in research	PSO – 9	Ap
CO - 5	Explain the principles and working mechanisms of various instruments	PSO – 7	U
CO - 6	Implement biological data in solving biological problems	PSO – 2	C

Semester : **II** **Major Core VI**
Name of the Course : **Biochemistry and Biophysics**
Subject code : **PB1723**

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	Understand the structure and functions of different biomolecules	PSO - 2	U
CO - 2	Apply the basic principles and concepts of thermodynamics in biological systems	PSO –4	Ap
CO - 3	Propose a protocol for purification of proteins	PSO - 5	C
CO - 4	Demonstrate the mechanism of enzyme action	PSO – 2	Ap
CO - 5	Compare denaturation and re - naturation of proteins	PSO – 9	E
CO - 6	Understand the significance of energy currency in biology	PSO – 6	U

Semester : **II** **Elective II (a)**
Name of the Course : **Medicinal Botany and Pharmacognosy**
Subject code : **PB1724**

CO	Upon completion of this course the students will be able to:	PSO Addressed	CL
CO - 1	Identify the traditional systems of medicines in terms of Siddha, Ayurvedha, and Unani	PSO – 1	An
CO - 2	Describe the conservation of medicinal plants <i>-in situ</i> and <i>ex situ</i>	PSO – 3	U
CO - 3	Summarize the methods that extract oil from Eucalyptus, Cymbopogon, Rose, and Santalum	PSO - 4	Ap
CO - 4	Understand the extraction procedures for withanolides, hyoscyamine, vinblastine.	PSO – 9	U
CO - 5	Categorize the drugs in terms of morphological, taxonomical, pharmacological, and chemical	PSO - 4	An
CO - 6	Analyze crude drugs both qualitatively and quantitatively	PSO – 5	An

Semester : **II** **Elective II (b)**
Name of the Course : **Medicinal Plants and Ethnobotany**
Subject code : **PB1724**

CO	Course Outcomes Upon completion of this course, students will be able to	PSO Addressed	CL
CO - 1	Categorize major and minor ethnic groups of Kanyakumari and their lifestyles	PSO – 3	An
CO - 2	Distinguish between forest and ethnic groups	PSO – 8	U
CO - 3	Understand the significance of tribal medicine	PSO – 1 5	U
CO - 4	Differentiate indigenous medicines of traditional medicine, Ayurvedha, Siddha, and Unani	PSO - 4	U
CO - 5	Classify , analyze and evaluate drugs	PSO - 5	An
CO - 6	Explain economic potential of phytomedicine and potential drug yielding plants	PSO – 5	U
CO - 7	Estimate different groups of biodynamic compounds	PSO - 4	Ap

Semester : **I** **Practical I**
Name of the Course : **Plant Diversity – I –Algae, Fungi,
 Bryophytes; Microbiology and Plant
 Pathology; Developmental Botany**

Subject code : **PB17P1**

CO	Upon completion of this course, the students will be able to:	PSO Addressed	CL
CO - 1	Micropreparation and specimen identification of thallophytes	PSO – 2	Ap
CO - 2	Identification of cryptogams on the basis of morphological characters	PSO – 3	U
CO - 3	Differentiate gram positive and gram negative bacteria	PSO – 1	U
CO - 4	Examination of bacteria by biochemical characterization	PSO – 9	E
CO - 5	Study on ovule modifications and wall patterns of pollen grains	PSO – 2	An

Semester : **II** **Practical II**
Name of the Course : **Pteridophyta, Gymnosperm and
 Paleobotany; Research Methodology;
 Biochemistry and Biophysics**

Subject code : **PB17P2**

CO	Upon completion of this course, the students will be able to:	PSO Addressed	Cognitive level
CO - 1	Micropreparation and specimen identification of vascular cryptogams	PSO –8	Ap
CO - 2	Identification of Pteridophytes and Gymnosperms based on their anatomical features	PSO – 6	U
CO - 3	Determination of k_m and P_{ka} values	PSO – 2	E
CO - 4	Estimation of macromolecules	PSO – 9	E
CO - 5	Quantitative analysis of secondary metabolites	PSO – 5	An
CO –6	Analyze different biological data using biostatistics	PSO – 2	An

Semester : **III** **Major Core VII**
Name of the Course : **Taxonomy of Angiosperms and Economic
 Botany**

Subject code : **PB1731**

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 - 8	Ap
CO - 3	Collect and prepare herbaria for future use	PSO – 9	C
CO - 4	Record the rules and regulations framed by ICBN	PSO – 2	R
CO - 5	Interpreting biological knowledge in comparing and ranking plants	PSO - 3	An
CO - 6	Evaluation of plants by using dichotomous keys	PSO – 7	E

Semester : **III** **Major Core VIII**
Name of the Course : **Genetics and Molecular Biology**
Subject code : **PB1732**

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	PSO – 2	C
CO - 5	Identify various types of operons	PSO - 3	R
CO - 6	Analyze Transcription and Translation of Prokaryotes and Eukaryotes	PSO – 5	An
CO - 7	Evaluate the problems in genetics	PSO – 6	E

Semester : **III** **Elective III (a)**
Name of the Course : **Forestry**
Subject code : **PB1733**

CO No:	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 – 8	R
CO - 3	Summarize the methods in managing and conserving the forest	PSO - 2	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 - 8	U
CO - 6	Evaluate the utilization of forest	PSO – 3	E

Semester : **III** **Elective III (b)**
Name of the Course : **Horticulture and Plant Breeding**
Subject code : **PB1733**

CO No:	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	Explain the nature of floriculture	PSO – 8	U
CO - 6	Understand the methods involved in hybridization	PSO – 9	U
CO - 7	Describe the molecular approaches for crop improvement	PSO – 2	U

Semester : **IV** **Major Core IX**
Name of the Course : **Plant Physiology and Metabolism**
Subject code : **PB1741**

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 –3	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 6	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 – 9	C

Semester : **IV**
Name of the Course : **Environment and Conservation Biology**
Subject code : **PB1742**

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 – 8	An
CO - 3	List out the various food chains in ecosystem	PSO – 1	R
CO - 4	Implement the mode of studying vegetation	PSO – 3	Ap
CO - 5	Understand the importance of conservation strategies	PSO – 8	U

Semester : **IV** **Major Core XI**
Name of the Course : **Applied Biotechnology**
Subject code : **PB1743**

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 – 5	C
CO - 2	Differentiate batch, continuous and fed batch culture	PSO – 6	An
CO - 3	Understand the principle and types of biosensor	PSO – 9	U
CO - 4	Determine marker assisted selection of qualitative and quantitative traits	PSO – 5	Ap
CO - 5	Evaluate the pros and cons of Transgenic plants	PSO – 8	E
CO - 6	Recall the different aspects of pharmaceuticals	PSO – 4	R
CO - 7	Understand the basics of Nanotechnology	PSO – 9	U

Semester : **IV** **Elective IV (a)**
Name of the Course : **Industrial Microbiology**
Subject code : **PB1744**

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	Describe the main steps and processes used to produce biological products in industry.	PSO - 7	U
CO - 2	Analyse the physical and chemical conditions that are involved in the production of useful industrial products of microbial origin	PSO - 1	An
CO - 3	Cultural and genetic manipulation of the microorganisms in order to produce more useful products	PSO - 5	C
CO - 4	Highlight the importance of microorganisms in the production of useful human products	PSO - 4	R
CO - 5	Evaluate techniques that are applicable to improve production	PSO - 9	E
CO - 6	Identify the microorganisms which are important in the production of many useful products	PSO - 1	R
CO - 7	Apply new useful microbial techniques and store them reliably for later use.	PSO - 9	Ap

Semester : **IV** **Elective IV (b)**
Name of the Course : **Biostatistics and Bioinformatics**
Subject code : **PB1744**

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	Recall the types of statistical analysis	PSO - 2	R
CO - 2	Analyse the biological data	PSO - 5	A
CO - 3	Interpret the ungrouped {or raw} data into {classified} analytical form	PSO - 2	U
CO - 4	Collect, tabulate, interpret and correlate the data with hypotheses	PSO - 2	Ap
CO - 5	Evaluate the research data with bioinformatic tools	PSO - 5	E
CO - 6	Assemble the explorations of advanced sciences	PSO - 6	C

Semester : **III** **Practical III**
Name of the Course : **Taxonomy of Angiosperms and Economic Botany; Genetics and Molecular Biology**
Subject code : **PB17P3**

CO	Upon completion of this course, the students will be able to:	PSO Addressed	Cognitive level
CO - 1	Isolate the DNA from plant materials	PSO – 9	Ap
CO - 2	Separation of biomolecules using spectrophotometry	PSO – 2	Ap
CO - 3	Analyse the floral parts and relate to its corresponding family	PSO – 3	An
CO - 4	To solve genetics related problems	PSO – 2	E

Semester : **IV** **Practical IV**
Name of the Course : **Plant Physiology and Metabolism; Environment and Conservation Biology and Applied Biotechnology**
Subject code : **PB17P4**

CO	Upon completion of this course, the students will be able to:	PSO Addressed	Cognitive level
CO - 1	Analyze DO, BOD and COD of water	PSO – 7	An
CO - 2	Prepare tissue culture media, initiate callus culture, anther culture, pollen culture, etc	PSO – 9	Ap
CO - 3	Identification of phytoplanktons in water bodies	PSO - 1	U
CO - 4	Evaluate the metabolic reactions in plants	PSO – 2	E
CO - 5	Report on common environmental problems, their consequences and possible solutions	PSO –3	E