



THE MADURA COLLEGE

An Autonomous Institution affiliated to Madurai Kamaraj University

Re-accredited (3rd cycle) with 'A' grade by NAAC

Vidya Nagar, T.P.K. Road, Madurai – 625 011

DEPARTMENT OF BOTANY

Course Outcomes mapped with POs

PROGRAMME : M.Sc. (Botany)

Course Code	Course Title	CLO	Mapping of CO with PO				
			PO1	PO2	PO3	PO4	PO5
21P1BMC1	Plant Diversity - I	The vegetative and reproductive morphology; classification and phylogeny of lower algae	1	1	2	2	2
		The ecology, exclusive cellular components and economic importance of algae	2	2	2	3	2
		The general characters, culture methods, classification, phylogeny and economic importance of fungi	2	3	3	2	3
		The special considerations of fungi and thallus organizations, reproduction and economic importance of lichens	3	3	3	3	3
		The salient features, major classes, ecology and economic importance of bryophytes	3	3	3	2	3
21P1BMC2	Plant Diversity - II	The general features, classification, evolution and economic importance of Pteridophytes	1	2	3	1	2
		The comparative characteristics of orders of Pteridophytes	2	1	3	2	2
		The salient features, origin and classification of Gymnosperms	3	3	3	3	3
		The anatomy, reproduction, phylogeny and economic importance of Gymnosperms	3	3	1	2	3
		The concept of Palaeobotany, geological time scale, fossilization methods and study of fossils	3	3	2	3	3
21P1BMC3	Plant Anatomy, Embryology and Morphogenesis	The characteristics and classifications of meristems, theories on apical meristems, secondary and anomalous secondary structures of stem and root	1	2	3	1	2
		The micro and megasporogenesis; development of male gametophyte, ontogeny of types of embryo sac and endosperms	2	1	3	2	2
		The pollen pistil interactions, double fertilization, classification of embryo development and polyembryony	3	3	3	3	3
		The components of morphogenesis like cell division, cytoskeleton, cambial activity and xylem and phloem differentiation	3	3	1	2	3

		The development of leaf, flower and galls; and role of polarity in plant development	3	3	2	3	3
21P1BME1	Organic Farming	The importance, scope, principles, concepts and Indian and global scenario of organic farming; green revolution, agroforestry and natural resources management	3	2	2	1	1
		The organic sources of nutrients, organic waste recycling, manuring methods and crop management	3	2	1	3	1
		The indigenous practices of organic farming and its effects on crops	2	2	1	3	3
		The quality considerations, marketing and export opportunities of organic farming	1	1	1	2	3
		The biointensive nutrient management, weed management, rice production in organic farming	2	2	1	2	3
21P1BMP1	Practical I	The external and internal morphology of Algae, Fungi, Lichens, Bryophytes, Pteridophytes and Gymnosperms	2	1	2	2	3
		The phylogenetic relationships of within and between the members of Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms	3	2	2	2	2
		The knowledge on economic importance in Algae, Fungi, Lichens, Bryophytes, Pteridophytes and Gymnosperms	1	3	3	2	3
		the fossil forms of these plant divisions	3	2	2	3	3
		The demonstration of mass culturing of some economically important algal and fungal members	2	2	2	3	2
21P1BMP2	Practical II	The internal morphology of apical meristems, primary structure of dicot stem and root, monocot stem and root	1	2	1	3	2
		The normal and anomalous secondary structure of dicot stem	1	1	2	2	2
		The pollen morphology, germination and its viability	1	2	3	2	3
		The structure and types of ovules, structure of dicot and monocot embryo	1	2	2	2	3
		The demonstration of culturing pollen, embryo and endosperms; demonstration of crop improvement techniques	1	3	2	3	2
21P2BMC4	Cell & Molecular Biology	The various components of cell and their functions	2	3	3	1	2
		The different phases of cell cycle and their regulation	2	3	3	2	2
		The molecular basis of inheritance that governs plant development	1	3	3	2	3
		The general principles of gene organization and expression at transcriptional and translational level	1	2	3	2	2
		The cell signaling pathways and gene mapping	1	2	3	2	3
21P2BMC5	Genetics, Plant Breeding & Evolution	The inheritance basis of qualitative and quantitative characters in a population and deviation from the common pattern of inheritance	2	3	3	1	2
		The modern gene concept and the molecular mechanisms of mutation and its respective biochemical responses	2	3	3	2	2
		The linkage and crossing over, various methods of chromosome mapping using crossing over and molecular markers	1	3	3	2	3

		The methods in conventional and modern breeding techniques for crop improvement and conservation of species and genetic diversity	1	2	3	2	2
		The various concepts of origin of cell and evolution	1	2	3	2	3
21P2BMC6	Ecology & Conservation Biology	The autecology and population ecology; various interactions and ecological issues	3	3	3	3	3
		The types and dynamics of ecosystem; biogeochemical cycles and ecological amplitude of a species	1	2	2	2	2
		The renewable and non-renewable energy sources; pollution and its impact; and disaster management	2	2	2	2	2
		The levels and threats of biodiversity; phytogeography of world and India; hypothesis and tools of phytogeography	1	1	2	2	3
		The <i>in situ</i> and <i>ex situ</i> conservation methods and social movements for conservation	3	2	3	2	2
21P2BME2	Horticulture	The divisions of horticulture, facts and applications of biofertilizers, irrigation methods	2	3	1	1	3
		The advantages and disadvantages of various methods of plant propagation	1	3	1	3	3
		The horticultural practices of fruit crops	2	1	1	2	2
		The floriculture and landscape gardening	3	3	1	2	3
		The types of garden, principles and methods of landscape designing	2	2	1	3	3
21P2BMP3	Practical III	The phenotypic and genotypic ratios from the given crosses of different allelic or gene interactions	2	3	2	3	3
		The construction of genetic methods of chromosome mapping	3	2	3	2	2
		The demonstration of various plant breeding techniques for crop improvement	2	2	2	3	3
		The techniques in observation of cell organelles, cell divisions, karyogram and idiogram	3	3	3	3	2
		The DNA isolation and physical mapping techniques	2	2	2	2	2
21P2BMP4	Practical IV	The outline and associate the adaptations and distribution of plant communities for effective conservation	1	3	2	2	3
		The information, to infer the various chemicals present in the soil, thereby manage soil efficiently for plant growth	1	2	2	2	3
		The quality of various water samples	1	2	3	2	3
		Discuss the various method of plant propagation	1	2	2	2	3
		Explain the landscape	1	2	2	2	2
21P3BMC7	Microbiology and Plant Pathology	Concept, scope and importance of bacteriology.	1	1	3	2	1
		Virology and control the microorganisms.	1	1	3	2	1
		Food, Industrial and Agricultural microbiology.	1	1	3	2	1
		Plant diseases, symptoms and mechanism of action.	1	1	3	2	1
		Plant disease management and mitigation.	1	1	3	2	1
21P3BMC8	Biochemistry	The molecular architecture of a plant cell and the essential elements of biochemistry and thermodynamics.	1	1	1	1	1

		The general structure, physical and chemical properties of sugars and lipids and their metabolism.	2	2	2	2	1
		The general structure, physical and chemical properties, biosynthesis and breakdown of amino acids and proteins.	1	2	2	2	1
		The enzymes, nomenclature, classification, active sites substrate specificity, kinetics and regulation.	1	1	2	2	2
		The vitamins, their role and deficiency symptoms; and the secondary metabolites namely phenolics, flavonoids, alkaloids and terpenes.	1	2	3	3	3
21P3BMC9	Taxonomy of Angiosperms	The classification of angiosperms by various methods of orthodox to modern methods including phylogenetic and cladistic.	1	1	2	2	2
		To resolve the taxonomic problems using evidences of cytology, embryology, phytochemistry and micromolecular support.	2	2	2	1	2
		To understand the principles of nomenclature, rules of ICN, taxonomic literature for authentic identification of plant species.	1	3	1	2	1
		To identify and describe the economic potential of dicot families with their morphological features.	3	3	2	2	2
		To enumerate the systematic features of monochlamydeae and monocot families for their utilization and conservation.	3	2	3	2	1
21P3BMDC	Forestry & Economic Botany	Natural and artificial regeneration of forests and management of temperate and sub-tropical forests.	3	-	3	2	3
		Concept of tree improvement methods and techniques, traditional and recent advances in tropical silvicultural research and practices.	2	3	2	3	2
		The forest working plan and developmental projects, tribology and participation of tribes on forestry programmes.	2	3	2	3	1
		Forest utilization and legislation like timber and non-timber forest produces.	1	3	2	-	1
		Commercial products derived from plants that provide us with consumable products such as cereals, fruits and vegetables, beverages, spices and condiments and materials such as cloth and wood.	-	1	1	-	1
21P3BMP5	Practical V	Estimate the amount of glucose, protein and lipid	1	1	1	1	1
		Separate molecules through paper and column chromatography and analyse enzyme assays	2	2	2	2	1
		Prepare media for bacterial and fungal culture	1	2	2	2	1
		Isolate bacteria and fungi from various substrates	1	1	2	2	2
		Identify and analyse the crop diseases thereby manage diseases effectively	1	2	3	3	3
21P3BMP6	Practical VI	The morphological observation of various plant parts	2	2	1	3	3
		The dissection of the floral parts of dicot families and study their reproductive structures	3	3	2	2	2
		The dissection of the floral parts of monocot families and study their reproductive structures	3	2	2	-	1
		The precise identification of plant taxa using modern taxonomic methods	3	2	1	2	1

		The preparation and maintenance of herbarium for authentic plant identification and nomenclature	3	2	2	1	2
21P4BM10	Genomics and Bioinformatics	The genome organization in prokaryotes and eukaryotes	1	3	3	2	3
		The methods used in gene sequencing and proteome analysis	1	3	2	2	3
		The concept of biological databases and the use of different public domain databases of DNA and protein for sequence retrieval	1	3	3	2	3
		The concept of sequence alignment and tools used in sequence analysis for solving biological problems	1	3	3	3	3
		The phylogenetic tree construction and protein structure prediction tools	2	3	3	3	3
21P4BM11	Biotechnology	Discuss various scope of biotechnology and familiarize the basics of plant tissue culture techniques.	3	3	2	3	2
		Identify various <i>in-vitro</i> regeneration pathways in plants for commercial usage.	3	2	2	1	2
		Illustrate and demonstrate the principle and application of recombination DNA technology.	2	1	1	2	1
		Recall and demonstrate the cloning methodologies and molecular techniques.	3	1	2	1	1
		Apply different methods of vector construction for the production of transgenic crop plants with desired traits.	2	1	1	1	1
21P4BM12	Plant Physiology	The water regime in plants, mineral nutrition and mechanism of transpiration	1	2	1	1	3
		The biogeochemical cycles and translocation of photo assimilates	1	2	1	1	3
		The photosynthetic and respiration pathways	1	2	1	1	3
		The physiological roles of photoreceptors and phytohormones	1	2	1	1	3
		The stress and plant response physiology	1	2	1	1	3
21P4BME4	Research Methodology	Designs in biological experiments, Methods of data collection. Frequency distribution table construction, Graphical representation of data and Measures of central tendency	1	3	2	3	3
		Measures of dispersion, Probability, Theorems on probability, Correlation and Regression, Tests of statistical, F-test, Correlation and Regression, One way ANOVA	1	2	2	2	3
		Microscopy - principles and applications of light - dark field, Micrometry, Centrifugation, Use of centrifuge and Chromatography technique	3	2	2	2	2
		Spectrophotometer, ELISA, autoradiography. Spectrophotometry Agarose gel electrophoresis, Polyacrylamide gel electrophoresis, Isoelectric focusing, Immuno Electrophoresis	2	1	3	1	1
		Research Ethics, Framing and selecting of research problems. Importance of literature review, Research data bases. Writing of research articles, plagiarism and biopiracy.	2	3	1	3	1
21P4BMP7	Practical VII	The retrieval of biological information form databases	1	3	3	2	3
		The sequence alignment and tools used in sequence analysis, phylogenetic tree construction and protein structure prediction	2	2	3	3	3

		The plasmid and chromosomal DNA extraction from <i>E. coli</i> and Plants samples using agarose gel electrophoresis	3	2	3	2	3
		The various <i>in vitro</i> plant regeneration pathways from selected explants through different tissue culture techniques	3	1	2	2	3
		The <i>Agrobacterium</i> mediated genetic transformation in plants and characterize the transgenic plants using molecular techniques	3	1	1	1	2
21P4BMP8	Practical VIII	The water potential and other related phenomena experimentally	1	2	1	1	3
		The membrane permeability, mineral transport and its deficiency through experiments	1	2	1	1	3
		The photosynthetic and other pigments involving different methods	1	2	1	1	3
		The stress related responses implying experiments	1	2	1	1	3
		The physiological setups, correlate image and graphs of physiological interest	1	2	1	1	3


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