

## Department of Botany Course Outcomes

Sl.No.	Semester	Course Code	Course Title	Course Outcomes(COs)	
1	1		<b>Microbial diversity, Algae and Fungi</b>	CO1	Understand the nature and role of Microorganisms like Bacteria & Viruses their uses directly and indirectly
				CO2	Explain Structure, Organization, Physiology, Reproduction & Economic importance of aquatic, autotrophic forms – Algae
				CO3	Explain about non chlorophyllous, heterotrophic forms – Fungi.
				CO4	Devise short write ups about microbial diversity using additional OE resources available in the internet using modern ICT tools.
				CO5	Discuss microorganisms, their control and their right use.
2			<b>Practical I Microbial diversity, Algae and Fungi</b>	CO1	Handle carefully microorganisms, Algae & Fungi in the practical lab.
				CO2	Observation of specimens & slides
				CO3	Explain about preparation of bio fertilizers
				CO4	Discuss bio-fertilizers.
3			<b>Diversity Of Archaeogniatae &amp; Plant Anatomy</b>	CO1	Explain about Bryophytes in which the plant body contains Thalloid or leafy structures
				CO2	Describe the highest group of vascular cryptograms & 1 <sup>st</sup> land Plants (Pteridophytes)
				CO3	Discuss the naked seed producing plants (naked seeded Plants of flowering plants) Gymnosperms
				CO4	Outline about a group of higher cryptograms and gymnosperms using additional OE resources available in the internet using modern ICT tools.
4			<b>Practical II: Diversity of Archaeogniatae &amp; Plant Anatomy</b>	CO1	Recognize Bryophytes –slides, sections and mounts.
				CO2	Identify Pteridophytes –slides, sections and mounts.
				CO3	Understand Gymnosperms –slides, sections, and mounts.
				CO4	Observe and identify internal structures of plants.
5			<b>Embryology and Taxonomy</b>	CO1	Understand the reproduction of plants, Haploid male and female gametes, fertilization of Zygote and embryo formation, embryo development and endosperm.
				CO2	Outline the concepts of Taxonomy with Identification, Nomenclature and various classification of plants using additional OE resources available in the internet using modern ICT tools.
				CO3	Discuss about the family's
				CO4	Study on Herbarium and Botanical Gardens
6			<b>Practical III: Embryology and Taxonomy</b>	CO1	Understand the Bentham and Hooker's System of Classification.
				CO2	Describe technical description of various plants
				CO3	Observe various Embryology slides.
7			<b>Plant Physiology and Metabolism</b>	CO1	Understand Plant physiology, a sub discipline of Botany concerned with functional aspects of plants
				CO2	Remember all internal metabolic activities of plants.
				CO3	Understand Photosynthesis & Respiration process.
				CO4	Explain the growth and development of plants using additional OE resources available in the internet using modern ICT tools.
				CO1	Understand the transport phenomenon of water and Transpiration.

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8			<b>Practical Paper IV: Plant Physiology and Metabolism</b>	CO2	Determine osmotic potential of vacuolar sap by plasmolytic method using leaves of Rhoeo / Tradescantia.
				CO3	Describe mineral deficiency symptoms using plant arial/photographs.
				CO4	Separate of chloroplast pigments using paper chromatography
				CO5	Rate of photosynthesis under varying CO <sub>2</sub> concentration.
				CO6	Discuss the effect of kind of light intensity, bicarbonate concentration in photosynthesis on oxygen evolution (Hydrilla funnel).
9			<b>Cell Biology, Genetics and Plant Breeding</b>	CO1	Understand the basic components of cell, key role of cell division during cell cycle
				CO2	Explain about inheritance and behaviour of chromosomes using additional OE resources available in the internet using modern ICT tools.
				CO3	Describe Plant Breeding and produce new crop varieties superior to existing types in all.
				CO4	Realize the cell as a structural and functional unit of life, basic components of a cell & explain basic principles.
10			<b>Practical V: Cell biology, Genetics and Plant breeding</b>	CO1	Understand the structure of cell organelles through photomicrographs.
				CO2	Describe the various stages of mitosis using cytological preparation of Onion root tips. Understand DNA packing by micrographs
				CO3	Solving numerical problems using Mendel's Laws of inheritance
				CO4	Explain Hybridization techniques – emasculation, bagging (for demonstration only).
				CO5	Calorimetric estimation of DNA by diphenylamine method
11			<b>Plant Ecology &amp; Phytogeography</b>	CO1	Explain various Ecosystems & relationships between Organisms and environment.
				CO2	Describe the Various Eco systems and Plant distribution.
				CO3	Discuss Phytogeography, the major plant communities of the world and different Vegetational belts of the earth with characteristic climatic Conditions of the area.
				CO4	Identify Phyto geographical Regions of India, Plant Biodiversity and its importance using additional OE resources available in the internet using modern ICT tools.
				CO5	Elaborate plant population and community Ecology
12			<b>Practical VI: Plant Ecology &amp; Phytogeography</b>	CO1	Understand the Ecosystem: Types, structure and functions of ecosystem (pond ecosystem). Determine minimal quadrat size and understand herbaceous vegetation in the college campus by species area curve method
				CO2	Discuss productivity of ecosystem-Primary, Secondary and Net productivity
				CO3	Understand Plant succession-Hydrosere and Xerosere
				CO4	Identify the hotspots, phyto geographical regions and distribution of endemic plants in the map of India.
				CO5	Explain Biodiversity, causes and conservation ( <i>In-situ</i> and <i>ex-situ</i> methods) and various methods in Seed banks using additional OE resources available in the internet using modern ICT tools.
				CO6	Discuss importance of nurturing biodiversity.
				CO1	Understand the Plant Tissue Culture Research, Principles, Totipotency, Thallus Culture, Meristem Culture, Organ Culture, Differentiation and Dedifferentiations.

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13			<b>Paper – VII (Eletive) Plant Tissue Culture and Bio-technological Applications</b>	CO2	Discus about Cryo preservation, embryo culture, production of secondary metabolites, applications of Tissue Culture.
				CO3	Discuss about restriction endonuclease, cloning vectors, genecloning.
				CO4	Discuss about methods of gene transfer and selection of transgenics
				CO5	Discuss about the applications of plant genetic engineering
14			<b>Practical – VII (Eletive) Plant Tissue Culture and Bio- technological Applications</b>	CO1	Preparation of MS Medium
				CO2	Tools or Instruments used in sterilization, tools used in Genetransfer
				CO3	Photographs of Genetically modified crops
				CO4	Discuss r-DNA Technology
15			<b>Plant diversity and Human Welfare VIII- A1</b>	CO1	Explain about the rare, endangered, endemic species and their biodiversity.
				CO2	Create awareness about the plants& their Biodiversity.
				CO3	Understand solid and liquid waste management techniques.
				CO4	Explain about Environmental Impact Assessment (EIA), Geographical Information using additional OE resources available in the internet using modern ICT tools.
				CO5	System GIS, green account with emphasis on carbon footprint, resource accounting
				CO6	Realize ecological importance of plants and discuss the role of plants in relation to Human Welfare.
16			<b>Practical VIII A1: Plant diversity and Human Welfare</b>	CO1	Understand plant diversity (flowering plants) and Maceration, wood (Tracheary elements, fibres).
				CO2	Explain exotic species- Identification and morphological characteristics.
				CO3	Identify forest trees through bark, wood, flowers leaves and fruits.
				CO4	Discuss various methods of preservation and canning of fruits using additional OE resources available in the internet using modern ICT tools.
				CO4	Knowledgeable through visits to the local ecosystem.
				CO5	Describe and practice effective solid and liquid waste management systems in rural/urban areas.
				CO6	Realize ecological importance of plants and describe the role of plants in relation to Human Welfare.
17			<b>Ethnobotany and Medicinal botany VIII A2</b>	CO1	Comprehensive Knowledge of various common plants, their use and medicinal values through primitive culture.
				CO2	Explain about concept, scope and objectives of Ethnobotany as an Inter-disciplinary science using additional OE resources available in the internet.
				CO3	Understand history, Scope and Importance of Medicinal Plants & indigenous Medicinal Sciences
				CO4	Describe the common medicinal plants in the neighbourhood for therepeutical use.
				CO5	Conserve endangered and endemic medicinal plants.
				CO6	Efficient in modern tool use to get additional knowledge from the internet.
18			<b>Practical VIII A2 Ethnobotany and Medicinal botany</b>	CO1	Demonstrat Morphological & Anatomical Characters of medicinally plants
				CO2	Discuss plants used in ayurvedic preparations
				CO3	Presentation of photographs of national parks, Biosphere Reserves and Botanical gardens
				CO4	Presentation of photographs of famous personalities of Ayurveda and Sidha medicin.
				CO1	Know various common plants, plant products, drugs and their chemical compounds and medicinal uses.

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19			<b>Pharmacognosy and Phytochemistry VIII A3</b>	CO2	Classify drugs and drug evaluation methods using additional OE resources available in the internet using modern ICT tools.
				CO3	Realizes primary and secondary metabolites and their differences, major types - terpenes, phenolics, alkaloids, terpenoids, steroids.
				CO4	Aware of sources of drugs and biosynthesis : (Phenols ,Steroids, Alcohols), enzymes, proteins and amino acids etc.
				CO5	Discuss the common crude drugs and their therepeutical values.
20				CO1	Identify various plant parts used as medicines, extract active principles from them, isolation by chromatographic techniques.
				CO2	Explain callus culture techniques for secondary metabolite enrichment and understanding ethno pharmacological principles.
				CO3	Collect locally available crude drugs from local venders and make a study of it.