## DEPARTMENT OF BOTANY

# Govt. Jajwalyadev Naveen Girls College, Janjgir (C.G.) B.Sc. BOTANY PROGRAM OUTCOMES

**PO1.** Critical Thinking: Understand the evolving state of knowledge in a rapidly developing field. Think logically and organize task in to a structured form. Plan, conduct and write a report on an independent term project.

**PO2.Practical Skills:** Students learn to carry out practical work, in the field and in the laboratory with the laboratory with minimal risk.

**PO3.** Scientific Knowledge: Apply the knowledge of basic science, life sciences and fundamental process of plants to study and analyze any plant form.

**PO4.Effective Communication:** Successful transfer of scientific knowledge both orally and in writing.

**PO5.** Social Interaction: Due to continuous field visits in the fields students interact with the social activities for their study.

**PO6:** The Botanist and Society: Apply reasoning informed by the contextual knowledge to assess plant diversity, its importance for social, health, safety, legal and environmental issues and the consequent responsibilities relevant to the biodiversity conservation practice.

**PO7.** Ethics: Convey the practice social, environmental and biological ethics. The subject teaches students about the ethical approach, not to cut the plants.

**PO8.** Effective Citizenship: Responsible for learning, develop honesty in work and respect for self and others.

**PO9.** Environment and sustainability: Insist the significance of conserving a clean environment for perpetuation and sustainable development.

**PO10.** Self-directed and life-long learning: Each and every aspect of the syllabus teaches life-learning.

## **Department of Botany**

### **B.Sc. Botany**

### **Program specific outcomes**

PSO1. Identify and list out common plants .

**PSO 2.** Understand classification , occurrence , morphology , anatomy , reproduction and life cycles of lower group and higher group of plants .

**PSO 3.** Identify affinities among different groups of plants.

**PSO 4**. Understand the values of plant diversity.

**PSO 5.** Gain the knowledge of evolution of plants.

**PSO 6**. To get introduced with fossils , fossilization and some primitive plants.

**PSO 7**. Understand different plant physiological process.

**PSO 8**. Understand the application of genetic engineering and plant tissue culture.

**PSO 9**. Understand the knowledge of ethanobotany in context of Chhattisgarh.

**PSO 10**. Understand the basic concept of ecology.

**PSO 11**. Perform the laboratories techniques in anatomy , physiology, biochemistry , ecology and utilization of plants.

**PSO 12**. Create platform for higher studies in Botany.

S.N.	Class	Paper	Title	Course Outcomes
1.	B.Sc. 1st Year	1 <sup>st</sup>	Bacteria, Viruses, Fungi, Lichens, and	On completion of this course students will be able * To gain knowledge about microbial diversity.
			Algae	* To understand about the general characters , classification , nutrition , reproduction, and life cycle of different fungi.
				* To get knowledge about general characters classification , range of thallus, structure of algae and occurrence.
				<ul> <li>* To know about life cycles of different algae</li> <li>* To understand about general account types , structure, nutrition and reproduction of lichens.</li> </ul>
				* To gain knowledge about economic importance of bacteria , Viruses , algae fungi and lichens.
				* To understand about mushroom Biotechnology.
	B.Sc. 1st Year	2 <sup>nd</sup>	Bryophytes, pteridophytes, Gymnosperms	*To get knowledge about classification, occurrence, structure and reproduction in bryophytes.
			and Palaeo- Botany	*To know the evolution of sporophytes in bryophytes.
				*To gain knowledge about stellar evolution, heterospory and seed formation habit in pteridophytes. To understand about occurrence, structure and life cycle of some important pteridophytes.

				*To understand about general characters, affinities, classification, distribution, structure and life cycles of gymnosperms. *To gain knowledge about geological
			PRACTICAL WORK	time scale, fossils and fossilization. *To have the knowledge of study of morphology, anatomy of algae, fungi, bryophytes, pteridophytes And gymnosperms. Students are capable to become practical knowledge about micro-
				<ul> <li>preparation and observation of permanent slides of genera.</li> <li>*To know the technique of identification of plant disease symptoms.</li> <li>*To gain knowledge of anatomy of some gymnosperms.</li> </ul>
2.	B.Sc. 2nd Year	1 <sup>st</sup>	Plant Taxonomy, Economic Botany, Plant Anatomy and Embryology	<ul> <li>*To know about Bentham and Hooker's system of classification.</li> <li>*To gain knowledge about IUCN, typification, numerical taxonomy chemotaxonomy.</li> <li>*To understand about preservation of plant Material and Herbarium techniques.</li> <li>*To know about Botanical garden Herbaria of India and also Kew Botanical garden, England.</li> </ul>

			*To gain knowledge about some important plant families and its economic importance.
			*To explore the uses of plants as fiber, timber, medicines, cereal, vegetable oil, sugarcane, fruits, spices, beverages and biodiesel plants. Also know about cultivation of important flowers and Ethanobotany of Chhattisgarh.
			*To understand about plant root and stem structure, RAM, SAM organization, permanent tissues, secondary growth and anatomical anomalies.
			*To understand about structure and development of dicot and monocot leaf.
			*To know the structure of a flower and its different parts.
			*To get introduced to development of Male and female gametophyte.
			*To know about pollination, self- incompatibility, fertilization, endosperm and embryo development, Polyembryony, apomixes and Parthenocarpy.
B.Sc. 2nd Year	2 <sup>nd</sup>	Ecology and Plant Physiology	* To have knowledge of ecology and its scope, understand different environmental and ecological factors, soil formation and soil profile.
			* To understand Liebig's law of minimum, Shelford's law of tolerance.

		<ul> <li>* To understand about morphological and anatomical adaptation in hydrophytes, xerophytes and epiphytes.</li> <li>* To know about population and community characteristics, Raunkiaer's life forms, population interactions.</li> </ul>
		*To have knowledge of succession, ecoton and edge effect, ecological niches, ecotypes, ecads, keystone species.
		* To know about the concept tropic levels and energy flow in ecosystem, food chain, food web and ecological pyramids.
		* To have knowledge of biogeochemical cycles.
		* To understand diffusion, permeability, osmosis, imbibitions, plasmolysis, water absorption, wilting, mineral nutrition, transpiration and guttation.
		* To gain knowledge about photosynthesis and respiration.
		* To knowledge about plant growth hormone mechanism of flowering.
		* To know photoperiodism ,Vernalization, seed dormancy, germination and plant movement.
	PRACTICAL WORK	* To get knowledge of study of some important plants in semi-technical language with their classification and identification.

				<ul> <li>* To know about morphology and anatomy of root, stem and leaves with the help of prepared slide.</li> <li>* To know the structure of flower and the technique of study of ovules, placentation, embryo with the help of slides.</li> <li>* To know about some experiments of osmosis, plasmolysis, transpiration, fermentation, photosynthesis, and respiration.</li> <li>* To have knowledge of studying of a community by quadrate method.</li> <li>* To get knowledge of some economically important plants.</li> </ul>
3.	B.Sc. 3rd Year	1 <sup>st</sup>	Plant Physiology, Biochemistry and Biotechnology	<ul> <li>* To understand plant water relation, osmosis, water absorption, transpiration, mineral nutrition in plants.</li> <li>* To gain knowledge about photosynthesis and respiration.</li> <li>* To have knowledge of how light and temperature affects flowering in plants.</li> <li>* To get introduced to the structure of Phytochrome and Cryptochrome.</li> <li>* To understand the mechanism of nitrogen fixation and lipid metabolism in plants.</li> <li>* To know about different types of plant movements.</li> </ul>

			<ul> <li>* To have knowledge of mechanism of action of enzymes.</li> <li>* To gain knowledge about seed dormancy.</li> <li>* To gain the main techniques of genetic manipulation and plant tissue culture.</li> </ul>
B.Sc. 3rd Year	2 <sup>nd</sup>	Ecology and Utilization of Plants	<ul> <li>* Define ecology and ecosystem.</li> <li>* To understand different ecological factors.</li> <li>* To understand about the interaction between biotic and abiotic components of the environment.</li> <li>* To understand about plant community and its development.</li> <li>* To have knowledge of ecosystem, food chain, food web and ecological pyramids.</li> <li>* To know about the concept of energy flow in the ecosystem.</li> <li>* To understand the population ecology and its development.</li> <li>* To have knowledge of ecological adaptation and succession.</li> <li>* To know about different Biogeographical Regions of India.</li> <li>* To acquire knowledge regarding forest and grassland vegetation of India and its analysis.</li> </ul>

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		PRACTICAL	<ul> <li>* To explore the uses of plants as cereal, vegetable oil, fibers, timber, spices, rubber and medicines.</li> <li>* To know about some physiological experiment of osmosis, plasmolysis,</li> </ul>
		WORK	transpiration, photosynthesis, respiration And separation of chloroplast pigments.
			* To know the technique of identification of carbohydrate, lipid and proteins.
			* To have knowledge of studying of a community by quadrate method.
			* To know about structure of ecosystem and water holding capacity of grassland and woodland soil.
			* To know about some economically important plants .