

Dutika Sahu College, Laida, Sambalpur

DEPARTMENT OF BOTANY

-: PROGRAMME OUTCOME:-

<i>OBJECTIVES</i>	<i>PROGRAMME OUTCOME</i>
1. To understand the role & importance of plants in sustaining life on earth and the interrelationship between human beings & nature. 2. To enable students gain requisite knowledge & acquire ability to apply them as & when required. 3. To create awareness on natural resources & their importance in sustainable development.	1. A fundamental understanding, comprehension, analysis & articulation of concepts studied. 2. Students will have the ability to identify problems/issues & come up with creative solutions. 3. Students will apply the gained knowledge on human welfare. 4. Apply the knowledge to develop the sustainable & eco-friendly technology in industrial botany. 5. Apply knowledge of medicinal & economic botany in day-to-day life.

COURSE OUTCOME OF B.SC. (BOTANY): -

SEMESTER	COURSE & SUBJECT	CO NUMBER	CO STATEMENTS: - ON SUCCESSFUL COMPLETION OF THIS COURSE, STUDENTS WILL BE ABLE TO
SEM-1	CORE-1 (Microbiology & Phycology)	CO-1	To study the different microbial life forms, reasoning their biological status.
		CO-2	Students can gain knowledge on algal classification, economic & ecological importance of algae.
		CO-3	Apply the micro biodiversity knowledge gained; analyze the fundamentals of cell structure & functions of organisms.
		CO-4	Develop a strong foundational knowledge on diversity, structure & life-cycle.
		CO-5	To assess-evaluate & summarize the complex topics concerning these lower kingdom life forms.
		CO-6	A student should be able to articulate, express verbally or demonstrate/write comprehensively on any of the topics covered.
	CORE-2 (Bio molecules & Cell biology)	CO-1	To study the structure, properties & functions of cell & it's components.
		CO-2	Students can understand the detailed knowledge on structure, classification &

			physicochemical properties of bio molecules.
		CO-3	Apply the knowledge gained, analyze the fundamentals of cell ultra structure, the structure & functions of cell organelles & cellular macro-micro bio molecules.
		CO-4	Students can analyze the knowledge on properties of cell & cell membrane, DNA staining techniques.
		CO-5	To assess-evaluate & summarize the knowledge on qualitative tests of bio molecules.
SEM-2	CORE-3 (Mycology & Phytopathology)	CO-1	To study detailed structure of fungus, different types of fungal spores & their mode of liberation.
		CO-2	Students can understand the detailed knowledge on different classes of fungi, their structure, classification life-cycle & reproduction.
		CO-3	Knowledge on diseases in plants caused by viruses, bacteria & fungi & biotechnological applications of fungi.
		CO-4	Conceptualize questions in the above mentioned complex subjects in plant life forms & their life-cycle.
		CO-5	Ability to summarize all the biological concepts illustrated through the topics covered & self-assesses the comprehension levels.
		CO-6	Acquire expression abilities on the above topics in writing, discuss or write in shapes of short/long, topic specific notes.
	CORE-4 (Archegoniate)	CO-1	Students can get detailed knowledge on morphology, anatomy, classification & properties of bryophytes, pteridophytes & gymnosperms.
		CO-2	Brief explanation on contribution of paleobotany with emphasis on Palaeozoic & Mesozoic era.
		CO-3	Understand spore morphology analysis & detailed knowledge on male & female reproductive structures in gymnosperms.
		CO-4	Identify key concepts/ideas on life forms under archegoniate, reasoning their phylogeny & biological status in plant kingdom.
		CO-5	Ability to summarize all the reproduction, economic importance & ecological

			significance of all plant kingdoms.
	GE-2A (Plant Physiology & Metabolism)	CO-1	Define the terminologies:- plant water relations, ascent of sap, transpiration, plant growth regulators & nitrogen metabolism.
		CO-2	Explain processes of mineral nutrition, absorption of water, mechanisms of water loss from plants.
		CO-3	Demonstrate processes of imbibition, osmosis and plasmolysis.
		CO-4	Comprehend the different physiological processes & metabolic pathways in plants.
		CO-5	Ability to summarize all the biological concepts illustrated through the topic.
		CO-6	Come-up with comprehensive notes that students can articulate, express, write in any verbal or written assessment process.
SEM-3	CORE-5 (Anatomy of angiosperms)	CO-1	To study the internal structure & arrangement of tissues in angiospermic plant.
		CO-2	Understand different types of plant tissues.
		CO-3	Know the morphological & anatomical adaptations of plants growing in different habitats.
		CO-4	Students can analyze the anatomical studies of leaf, stem & root.
		CO-5	Ability to summarize the structure & functions of all tissues.
		CO-6	Hands on experiences on slide preparation for anatomical studies.
	CORE-6 (Economic Botany)	CO-1	Students can enhance their knowledge on morphology, uses & economic importance of crop plants.
		CO-2	Botanically identify & technically describe several economically important Cereals, Pulses, oil yielding plants, spices & medicinal crops of India.
		CO-3	Knowledge on uses of industrially important plant.
		CO-4	Analyze the knowledge on economically important plant parts & their products.
		CO-5	Ability in conceptualizing the above prescribed topics.
	CORE-7 (Genetics)	Co-1	Students will understand the genetic terminology of genetics & laws of mendelism.
		CO-2	Understand the fundamentals of Mendelian genetics, it's deviations & their applications.

		CO-3	Students will able to construction of linkage map by test-cross.
		CO-4	Develop analytical abilities foe solving problems in genetics.
		CO-5	Student gets idea & easily evaluates various types of inheritance & structural changes in chromosome.
		CO-6	Understanding the concept of gene structure, gene mutations & population genetics.
SEM-4	CORE-8 (Molecular Biology)	CO-1	Define terminologies related to molecular biology.
		CO-2	Student should be able to gain knowledge in different aspects of nucleic acids, their structure &v functions including historical perspectives.
		CO-3	Have a clear idea on the mechanisms involved in storage, processing & transmission of bio-genetic information through DNA replication.
		CO-4	Understand the cytological aspects of growth & development.
		CO-5	Understand DNA as the basis of heredity & variation.
		CO-6	Student can get practical acquaintance of isolation & quantification of DNA from plants.
	CORE-9 (Plant ecology & Phytogeography)	CO-1	Students can gather knowledge on origin, formation & properties of abiotic components of the ecosystem.
		CO-2	Knowledge on properties of communities in a population & tropical and habitat organization in an ecosystem.
		CO-3	Study & acquired knowledge about ecological ecosystem dynamics including different components of environment.
		CO-4	Develop comprehensive ideas on population ecology & dynamics, different phytogeographic classification of the state & country, concepts of continental drift & endemism.
		CO-5	Practical knowledge on vegetation study & different ecological sites.
		CO-6	Come-up with comprehensive notes that students can articulate, express, write in any verbal or written assessment process.
	CORE-10	CO-1	To gather an overview of nomenclature,

	(Plant Systematics)		identification, classification & studying the concept of taxonomy.
		CO-2	To learn the techniques of effective & valid publication and knowledge about ICAN & its principles.
		CO-3	Students will be able to learn the characters of various families, their key & floral formula, systematic position & herbarium preparation.
		CO-4	Able to determine the characteristic of plants like Asclepidiaceae, Lamiaceae, Acanthaceae, Rubiaceae families.
		CO-5	Students can face assessments on any evaluation process on the above mentioned topics along with concepts of biosystematics, identification, virtual herbarium, E-flora.
		CO-6	Various local & long excursions in this course will help to familiarise the students with the methods of collection, preservation of plants & learning about them.
	GE-2B (Plant anatomy, Embryology & Biotechnology)	CO-1	Imparting an insight into the internal structure & reproduction of the most evolved group of plants, the angiosperm.
		CO-2	Understand the individual cells & also tissues simultaneously.
		CO-3	Understand the structural adaptations in plants growing in different environment.
		CO-4	Understand the morphology & development of reproductive parts.
		CO-5	Understand the techniques used to preserve & study plant materials.
		CO-6	Students can learn flower dissection & study of flower reproductive parts.
SEM-5	CORE-11 (Reproductive biology of angiosperms)	CO-1	State & visualise the history & scope of sexual reproduction in higher plants.
		CO-2	Identify & discuss different important concept points on pollen & ovule biology starting from sporogenesis.
		CO-3	Describe the process of double fertilization & triple fusion.
		CO-4	Develop clear cut ideas on embryo, endosperms, structure of pollen.
		CO-5	Understand the knowledge on embryology & embryological abnormalities in angiosperms.
	CORE-12	CO-1	Student can acquire detailed knowledge on

	(Plant Physiology)		mechanisms of water, minerals & nutrient absorption of plants.
		CO-2	Understand the concept of plant-water relationship.
		CO-3	Demonstrate the processes of imbibition, osmosis, transpiration.
		CO-4	Develop clear cut ideas on water potential, it's component interactions in water relations.
		CO-5	Establish & display the mechanisms of water & mineral conduction, photosynthetic translocation.
		CO-6	Students will have hands on training to determine the physiological experiments related to plants.
	DSE-1 (Analytical techniques in plant science)	CO-1	To gain knowledge on different types of instruments & techniques involved in plant study.
		CO-2	Understand the principles & application of centrifuge.
		CO-3	Students can enhance their basic knowledge on biostatistics including measures of central tendency.
		CO-4	Students can acquire knowledge on microscopy.
		CO-5	Students can analyze the different analytical techniques of separation, profiling & identification of plant cells.
		CO-6	While a student is able to critically analyze the topics enunciated above can evaluate & state the concepts & phenomenon clearly that underlie the above mentioned subject.
	DSE-2 (Natural resources management)	CO-1	To discuss basic concepts of natural resources, sustainable utilization, biological resources, management strategies.
		CO-2	To understand the management of agricultural, horticultural, sericultural utilization & soil degradation.
		CO-3	Students will learn about contemporary practices in resources management, EIA, GIS, ecological footprint, waste management.
		CO-4	Understanding National & International efforts in resources management & conservation.
		CO-5	Students can improve their basic understandings on IPR, global arena on resources management.

		CO-6	Hands on experience on forest study using tools like GPS/GIS & understanding the ecological importance of forest resources.
SEM-6	CORE-13 (Plant Metabolism)	CO-1	To give a comprehensive idea on the concept of metabolism, pathways & their regulations, various cycle in plants like Calvin, HSK, C3, C4, CAM etc.
		CO-2	Study & critically analyze the metabolic steps involved in Carbon fixation & assimilation in plants.
		CO-3	Describe the complex processes of Oxidation of Carbon along with the detailed, step wise reactions in Glycolysis & energy harvest & storage in ATP synthesis.
		CO-4	Thorough study of nature, types & biosynthesis of lipids, the process of biotic * abiotic Nitrogen assimilation & metabolism involved in amino acid biosynthesis.
		CO-5	Students will have hands on training of various chromatography techniques; biochemical & measurement test & learn elaborate calculation techniques.
	CORE-14 (Plant Biotechnology)	CO-1	To understand the fundamentals of plant tissue culture techniques & it's applications like callus culture, protoplast culture.
		CO-2	Define the concept of recombinant DNA technology, restriction mapping, gene cloning.
		CO-3	Understand the concept of totipotency, explants, callus, and micro-propagation.
		CO-4	Knowledge on development of transgenic plants for agricultural & industrial use.
		CO-5	Students can learn regarding the preparation of media for tissue culture.
		CO-6	Basic concepts of research, general laboratory practices, data collection & documentation, scientific writing.
	DSE-3 (Horticultural practices & Post harvest technology)	CO-1	Students will understand the scope & importance of horticulture.
		CO-2	Students will learn techniques of artificial & natural propagation.
		CO-3	Students get idea about various treatments for changing flowering season according demand in the market.
		CO-4	To give information about types of gardens & floriculture technology.

		CO-5	Students can analyze the horticultural techniques, landscaping & gardening.
		CO-6	Evaluate knowledge on post-harvest technology, disease management & germplasm management for horticulture.
		CO-7	Students will get accustomed with field visit to garden, nurseries, horticultural field & in some cold storage for giving an overall idea.
	DSE-4 PROJECT (Horticultural practices & Post harvest technology)	CO-1	Students gain knowledge in different horticultural techniques.
		CO-2	To understand the procedure & application of grafting technique.
		CO-3	Analyse the grafting techniques in ornamental plants (<u>Rosa indica</u>) & fruit tree (<u>Mangifera indica</u>).
		CO-4	Basic concepts of research, general laboratory practices, data collection & documentation, scientific writing & it's presentation through oral, power point & poster methods & how to conceptualize, design & execute a science project.
		CO-5	On completion of all six semesters, a Botany graduate should be able to express, articulate & write scientifically on any of the chapters/topics mentioned above.