

## **Department of Botany**

Programme Outcomes (POs):

The undergraduate students passing out from Don Bosco College, Kohima will be able;

To gain:

1. **Scientific Knowledge:** Students develop a comprehensive understanding of plant biology, including anatomy, physiology, ecology, and genetics.
2. **Research Skills:** Through laboratory work and field studies, students learn research methodologies, experimental design, data analysis, and interpretation.
3. **Critical Thinking:** Botany encourages critical thinking skills as students analyze complex biological systems and phenomena, formulate hypotheses, and evaluate evidence.
4. **Problem-Solving Abilities:** Students learn to address real-world challenges such as environmental conservation, agricultural sustainability, and biotechnological innovations related to plants.
5. **Career Opportunities:** Graduates can pursue diverse career paths such as botanists, ecologists, environmental consultants, conservationists, educators, and agricultural specialists.
6. **Further Education:** Many students pursue advanced degrees (Masters or PhD) for specialized research or teaching positions.
7. **Contribution to Society:** Botany graduates contribute to advancements in agriculture, environmental conservation, pharmaceuticals, and biotechnology, addressing global issues like food security and climate change.
8. **Personal Development:** Studying botany fosters a deeper appreciation and connection with the natural world, promoting environmental stewardship and personal well-being.
9. **Networking Opportunities:** Students engage with professionals and researchers in the field through internships, conferences, and collaborations, building valuable connections for future opportunities.
10. **Innovation and Entrepreneurship:** Some graduates may become entrepreneurs, establishing businesses related to plant biotechnology, agriculture, horticulture, or environmental sustainability.

### **Subject specific**

BCC-01: To understand the indepth science of microbiology and phycology

BCC-02: To understand the fundamental building blocks life and study different organelles and their functions

BCC-03: To acquire knowledge on mycology and diseases of plants.

BCC-04: To understand lower plants group including mosses, liverwort and hornworts and their morphology, life cycles, reproduction strategies, ecological roles and evolutionary significance.

BCC-05: To study the morphology and anatomy of angiosperms, including their vegetative and floral structures, tissues, vascular systems, and cambial activity.

- BCC-06: To understand the relationship between plants and human societies, with a focus on the practical and economic uses of plant.
- BCC-07: Provide understanding of genetics, including Mendelian principles, chromosome theory, extra-chromosomal inheritance, linkage, crossing over, chromosomal aberrations, gene structure, and population genetics.
- BCC-08: To understand the fundamental processes that occur at the molecular level within living organism (includes DNA, RNA, Proteins and other molecule)
- BCC-09: To explore more into ecology and the phytogeographical locations of plants
- BCC-10: To classify and organize plant based on their evolutionary relationships and shared characteristics
- BCC-11: To understand the reproductive biology of angiosperms, including the structures involved in pollen and ovule development, pollination mechanisms, fertilization processes, and post-fertilization events.
- BCC-12: To grasp knowledge on plant physiology.
- BCC-13: To gain necessary ideas on plant metabolism and its functions
- BCC-14: To introduce students to the principles and techniques of plant biotechnology, including plant tissue culture, recombinant DNA technology, gene cloning, gene transfer methods, and biotechnological applications in agriculture and industry.
- BDSE-01 A: To instill the analytical techniques in plant sciences.

### Course Outcomes (COs)

#### 1<sup>st</sup> Semester

<b>Course Outcomes</b>	<b>BCC-01</b>	Microbiology and Phycology	The students would learn the Darwin's theory of evolution, the concept of species, RNA and DNA virus, Bacteria and algae types
	<b>BCC-02</b>	Biomolecules and cell biology	Students will learn structures, functions and interactions of biomolecules. Students will have insight into cell processes such as metabolism, signaling, gene expression and cell division

#### 2<sup>nd</sup> Semester

Course Outcomes	BCC-03	Mycology	and	The students will get to
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		Phytopathology	know origin of fungi, features, thallus organization, reproduction, life cycle, applied mycology, the host-pathogen relationship and diseases of agricultural plants.
	BCC-04	Archegoniate	Students will learn the morphology, life cycles and reproductive strategies of these plants and explore their ecological roles and interactions within ecosystems

### 3<sup>rd</sup> Semester

Course Outcomes	BCC-05	Morphology and Anatomy of Angiosperms	Students will be able to identify and describe the various vegetative and floral structures of angiosperms, explain their functions, and understand the anatomical basis of plant growth and development.
	BCC-06	Economic Botany	Students will learn the identification and Classification of plants with economic importance and conservation with plant diversity and protection of endangered species through informed management strategies.

### 4<sup>th</sup> Semester

Course Outcomes	BCC-07	Genetics	Students will be able to explain Mendelian inheritance, analyze pedigrees, understand extra-chromosomal inheritance, calculate recombination frequencies, describe chromosomal aberrations,
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			differentiate classical and molecular gene concepts, and apply population genetics principles to genetic variation and speciation.
	BCC-08	Molecular Biology	Students will get an insight into the structure and functions of biomolecules such as DNS, RNA, Proteins and Enzymes. Also they learn the advancement in Biotechnology including genetic engineering, recombinant DNA technology and synthetic biology

5<sup>th</sup> Semester

Course Outcomes	BCC-09	Plant Ecology and Phytogeography	Students will understand the inter-relationship between the living world and the environment, the trophic organization, competitions of organisms, habitats, climax community, food chains, and the functional aspects of ecosystem.
	BCC-10	Plant Systematics	Students will learn to establish a systematic framework for organizing and naming plants species, genera, families and higher taxonomic groups
	BCC-11	Reproductive Biology of Angiosperm	Students will be able to describe the structural features and developmental processes associated with the reproductive organs of angiosperms, and explain the significance of these processes in plant reproduction.

6<sup>th</sup> Semester

Course Outcomes	BCC-12	Plant Physiology	Students will get an insight into how plants respond to environmental factors such as light, temperature, water and nutrients. They will also learn about nutrient uptake, transport and assimilation mechanisms
	BCC-13	Plant metabolism	The students get the concepts of metabolism, carbon assimilation, photosynthetic pigments, Carbon dioxide reduction, photorespiration, carbon oxidation, ATP-Synthesis, mechanisms of signal transduction, lipid and nitrogen metabolism.
	BCC-14	Plant Biotechnology	Students will be able to explain the theoretical basis of plant tissue culture, perform basic techniques such as protoplast isolation and culture, understand the principles of recombinant DNA technology, and evaluate the ethical and biosafety issues associated with plant biotechnology.
	BDSE-01 A	Analytical techniques in plant sciences	The students will grasp knowledge on microscopy, cell fractionation, chromatography, radioisotopes, spectrophotometry, auto-radiography, characterization of proteins and nucleic acids and biostatistical tools.

