G. D. College, Begusarai

Department of Botany

B. Sc. Programme Specific Outcome

PSO1:

To build enthusiasm for environmental protection and a knowledge of how science and botany affect society. Develop and increase interest, engagement, and commitment to the topic of botany via conceptual knowledge of botany principles.

PSO2:

The overall goal is to teach the students the fundamental principles and techniques of all the disciplines relevant to the wide range of plant-related applications.

PSO3:

To get a conceptual understanding of botany's importance and guiding principles. Students will be able to demonstrate their knowledge of many issues in microbiology, lower plants, angiosperm, cell biology, genetics, plant biotechnology, molecular biology, and plant pathology. They will be able to apply that knowledge to investigate a broad variety of unique phenomena.

PSO4:

Understanding the nature and fundamentals of taxonomy, anatomy, physiology, ecology, applied botany, and biochemistry in order to identify and classify local flora.

PSO5:

To gain laboratory skills and be able to test water, soil, and many physiological experiments. The scientific study of plant life, vermicomposting, and plant breeding are just a few of the many applications for applied botany.

B. Sc., Course Outcome

Year 1

Paper I

CO1: This course explains the general characteristics, classification, thallus structure, and economic importance of algae and the study of the life cycle of algal species e.g., *Nostoc, Oedogonium*, *Chara*, *Vaucheria*, *Fucus*, and *Polysiphonia*.

CO2: The course discusses the general characteristics, classification, and economic importance of fungi and the study of the life cycle of fungal species e.g., *Synchytrium, Phytophthora, Cystopus* (*Albugo*)*, Puccinia, Alternaria* etc.

CO3: The course discusses the characteristics of bacteria, and viruses, their economic significance and nitrogen fixation by cyanobacteria and bacteria.

CO4: Describe plant pathology and its concepts, including the study of viral, fungal, and bacterial diseases.

Paper II

CO1: Discuss the general account and evolution of gametophytes in Bryophytes.

CO2: An overview of the following genera with emphasis on the sporophyte growth and structure in *Marchantia*, *Anthoceros*, *Sphagnum* and *Polytrichum.*

CO3: Discuss the organization of stele, Telome concept, Heterospory and evolution of seed habit in Pteridophytes.

CO4: Discuss morphology, anatomy, and reproduction of the following genera, *Psilotum*, *Lycopodium*, *Equisetum* and *Ophioglossum*.

CO5: Study of fossil genera *Rhynia* and *Calamites*.

(Practical Work) Contents: Paper-I & Paper-II

CO1: To explain and demonstrate the practical concepts and techniques covered in the Paper-I & Paper-II, course curriculum.

Year 2

Paper III

CO1: Understand the fossilization process, assess the geological time scale, different fossil types, importance of fossils and study of some fossil genera such as *Lyginodendron*, *Cycadeoidea*.

CO2: Study of the sporophytic plant body, flower, fertilization, embryo development and seed development of *Pinus*, *Taxus* and *Gnetum*.

CO3: Study of botanical nomenclature, classification proposed by Bentham & Hooker, and Hutchinson.

CO4: Study of floral characters, floral diagram, floral formula and economic importance of families like Ranunculaceae, Apocynaceae, Lamiaceae, Verbenaceae, Fabaceae, Euphorbiaceae, Polygonaceae and Poaceae.

Paper IV

CO1: Explain the root and shoot's apical meristem and the principle and distribution of mechanical tissue.

CO2: Study anatomical adaptations in hydrophytes and xerophytes and anatomical study of abnormal secondary growths with some examples.

CO3: Understand megasporogenesis and microsporogenesis, and the development of embryosac, embryo, endosperm and polyembryony.

CO4: Study plant tissue culture techniques in detail.

CO5: Study of economically important plants of Bihar.

(Practical Work) Contents: Paper-III & Paper-IV

CO1: To explain and demonstrate the practical concepts and techniques covered in the Paper-III & Paper-IV, course curriculum.

Year 3

Paper V

CO1: Study about prokaryotic & eukaryotic cells and ultrastructure of plant cell.

CO2: Detailed ultrastructure and functions of the plasma membrane, mitochondria, plastid, ribosome, nucleus, and chromosome.

CO3: Study of types and different stages of cell division.

CO4: This course deals with Mendelian inheritance, deviation from mendel law, and sex determination.

CO5: Explains linkage and crossing over, gene interaction, and extranuclear inheritance.

CO6: Understand the types and molecular mechanism of mutation involving inducing mutations with chemical and physical mutagens and its role in crop improvement.

CO7: Learn basic concepts and applications of plant breeding in agriculture.

Paper VI

CO1: Understand the properties, structure, and classification of carbohydrates, lipids and proteins.

CO2: Understand nature, properties, structure, classification, nomenclature, mode of action of enzymes and factors affecting enzyme action.

CO3: Understand the details about DNA and RNA.

CO4: Basic understanding of pH, colloids and solutions.

CO5: Knowing the basic physiological interactions between soil, water, and plants as well as the movement of water in plants and stomatal transpiration.

CO6: Understand the biochemistry and physiology of photosynthesis, light & dark phase, photophosphorylation, C_3, C_4 and CAM pathway, different stages of respiration such as aerobic and anaerobic: Glycolysis, Kreb's cycle, electron transport chain, the generation of ATP.

CO7: Detailed study of phytohormones, and the mechanism of photoperiodism & vernalization.

Paper VII

CO1: Have a fundamental idea of DNA synthesis in prokaryotes and eukaryotes and different types of RNA and their roles.

CO2: Understand gene organization, its structure, expression and regulation in both prokaryotes and eukaryotes.

CO3: Learn about recombinant DNA technology, southern and northern blotting, DNA fingerprinting and DNA sequencing.

CO4: Study basic concepts in genetic engineering in plants, *Agrobacterium*-mediated gene transfer and merits and demerits of genetically modified plants.

CO5: Have a fundamental understanding of ecological factors, components and functions of ecosystems.

CO6: Learn about plant succession in xerosere and hydrosere.

Paper VIII

(Practical Work) Contents: Paper- V, Paper- VI & Paper- VII

CO1: To explain and demonstrate the practical concepts and techniques covered in Paper-V, Paper- VI & and Paper-VII, course curriculum.