GOVERNMENT GENERAL DEGREE COLLEGE, NARAYANGARH

PROGRAMME OUTCOME (PO)

&

COURSE OUTCOME (CO)

(According to Choice Based Credit System)

DEPARTMENT OF BOTANY

B. SC. GENERIC ELECTIVES IN BOTANY

(From Academic Session 2018-2019)

PROGRAMME OUTCOME (PO)

(According to Choice Based Credit System)

After completing this, students will able to learn the following things: -

1. Students will be able to know the discovery, structural features, replication processes of microorganisms including viruses, differences between lytic and lysogenic cycles of viruses, structural features of DNA (T phage) and RNA (TMV) viruses, economic importance of Virus.
2. Students will be able to know the discovery, general characteristics, reproduction techniques and economic importance of Bacteria.
3. Students are able to know the salient features, ecology, distribution, classification, thallus organization, morphology, life cycle and economic importance of Algae.
4. Students will be able to know the salient features, ecology and significance, distribution, classification, thallus organization, nutrition, reproduction and economic importance of Fungi.
5. Students will be able to know the unifying features of Arhegoniates and their alternation of generation.
6. Students will be able to know the general characteristic, classification (up to a certain taxon), morphology, anatomy, reproduction process, ecological and economical importance of Bryophytes, Pteridophytes and Gymnosperms.

B. SC. GENERIC ELECTIVES IN BOTANY

(From Academic Session 2018-2019)

PROGRAMME SPECIFIC OUTCOME (PSO)

(According to Choice Based Credit System)

PSO1: Understand the discovery, structural features, and replication processes of microorganisms, including viruses, and distinguish between the lytic and lysogenic cycles. Recognize the structural features of DNA (T phage) and RNA (TMV) viruses and appreciate their economic importance.

PSO2: Learn about the discovery, general characteristics, reproduction techniques, and economic significance of bacteria.

PSO3: Acquire knowledge of the salient features, ecology, distribution, classification, thallus organization, morphology, life cycle, and economic importance of algae.

PSO4: Understand the salient features, ecology, distribution, classification, thallus organization, nutrition, reproduction, and economic importance of fungi.

PSO5: Learn about the unifying features of Arhegoniates and their alternation of generations.

PSO6: Understand the general characteristics, classification (up to a certain taxon), morphology, anatomy, reproduction processes, and ecological and economic importance of Bryophytes, Pteridophytes, and Gymnosperms.

B. SC. GENERIC ELECTIVES IN BOTANY

(From Academic Session 2018-2019)

COURSE OUTCOME (CO)

(According to Choice Based Credit System)

BOTGDS 01A (C1T): - BIODIVERSITY (MICROBIOLOGY, ALGAE, FUNGI AND ARCHEGONIATE

After completing this, students will able to learn following things: -

- →Students will be able to know the discovery, structural features, replication processes of microbes, differences between lytic and lysogenic cycles, structural features of DNA (T phage) virus and RNA (TMV) virus, economic importance of Virus.
- →Students will be able to know the discovery, general characteristics, reproduction techniques and economic importance of Bacteria.
- →Students are able to know the salient features, ecology, distribution, classification, thallus organization, morphology, life cycle and economic importance of Algae.
- →Students will be able to know the salient features, ecology and significance, distribution, classification, thallus organization, nutrition, reproduction and economic importance of Fungi.
- →Students will be able to know the unifying features of Arhegoniates and their alternation of generation.
- →Students will be able to know the general characteristic, classification (upto family), morphology, anatomy, reproduction process, ecological and economical importance of Bryophytes, Pteridophytes and Gymnosperms.

BOTGDS 01B (C1P): -BIODIVERSITY (MICROBIOLOGY, ALGAE, FUNGI AND ARHEGONIATE)

Practical

After completion of this practical course students will be able to learn and understand the following things: -

- →Models of viruses (TMV and T-Phage), Line drawing of lytic and lysogenic cycle.

- →Temporary and permanent slide preparation, Gram staining process of bacterium.
- →Vegetative and reproductive structure of different species of algae and fungi.
- →Study of Herbarium of some selected diseased plant specimens (infected Barberry leaves, black stem rust of wheat) and study the causative agent.
- →Mycorrhiza- its types and structures
- →Morphology, T.S. and L.S. of reproductive structures by study of permanent slide of Marchantia, Funaria, Selaginella, Equisetum, Pteris, Cycas, Pinus.

BOTGDS -1B (C2T): PLANT ECOLOGY AND TAXONOMY

After completing this, students will able to: -

- →Understanding the role of different Ecological factors like Soil, Water, light and temperature; Origin, composition of soil profile; precipitation types, state of water in the environment, optimal-limiting factor of light and temperature.
- →Learning the Adaptive feature of Hydrophytes and Xerophytes.
- →Concept of Plant community, its characteristics, Ecotone, Edge Effect, succession.
- →Knowing about different Phyto geographical zones of India, endemic plant species, hotspots.
- →Concept of Ecosystem, food web, food chain, biogeochemical cycles.
- →Learn the types of classifications- artificial, natural and phylogenetic.
- →Gain knowledge about ICN, botanical nomenclature, its rules and limitations.
- →Brief study of Herbarium techniques.
- →Understanding the Taxonomic evidences from molecular, numerical and chemicals.
- →Concept of taxonomic identification, morphological characters, family, botanical name.

BOTGDS-1B(C2P): PLANT ECOLOGY AND TAXONOMY

(PRACTICAL)

After completion of this practical course, students will be able to learn and understand the following things: -

- →Study of instruments like thermometer, anemometer, hygrometer etc.
- →Concept of pH determination technique and rapid test technique.
- →Study of morphological adaptation of hydrophytes and xerophytes.

- →Principle and technique of determination of minimal quadrate size.
- →Gain knowledge about v. s. of flower, floral diagram, floral formula, ovary structure, systematic position of different families.

BOTGDS(C3T): PLANT ANATOMY AND EMBRYOLOGY

- After completing this, students will able to: -
- →Idea about root, shoot, apical meristems, simple and complex tissue.
- →Concept of vascular cambium, heart wood and sap wood, secondary growth.
- →Understanding the structure of root, stem & leaf of dicot and monocot.
- →Learn about the structural organization of flower.
- →Learn about the double fertilization and their significance
- →Know about the structure and development of dicot and moncotembryos; apomixes and polyembryony.

BOTGDS -1C(C3P): PLANT ANATOMY AND EMBRYOLOGY

(PRACTICAL)

After completion of this practical course students will be able to learn and understand the following things: -

- →Identifying features of Parenchyma, collenchyma and sclerenchyma
- →Main characteristics of both monocot and dicot stem and root
- →Structure of anther, tapetum
- →Types of ovules; types of embryo sac
- →Pollination types and dispersal mechanism
- →Adaptive anatomy of Xerophytes and hydrophytes. Dissection technique from embryo/endosperm in developing seed

BOTGDS1D(C4T): PLANT PHYSIOLOGY AND METABOLISM

After completing this, students will able to learn following things: -

- →Concept of Water potential; significance of Transpiration, Root Pressure, Guttation.
- →Significance of macro and micro elements in plant growth; brief idea of carrier, channels and pumps, active and passive transport.

- →Understand the process of Photosynthesis, Respiration and Nitrogen Metabolism.
- →Learn about sensory Photobiology
- →Know about the plant growth hormones (auxin, gibberelin, cytokinin, ethylene)
- →Understand the biosynthesis of terpenes, phenols, and nitro genous compounds.
- →Learn about mechanism of solute translocation, phloem loading –unloading method.
- →Know about dormancy, senescence, and stress physiology.

BOTGDS-1D(C4P): PLANT PHYSIOLOGY AND METABOLISM

(PRACTICAL)

After completion of this practical course students will be able to learn and understand the following things: -

- →Determination method of the osmotic potential of cell sap.
- →Effect of light and wind on Transpiration.
- →Principle of stomatal index and stomatal frequency calculation.
- →Process of Hill reaction.
- →Effect of Ph and enzyme conc. on Catalase activity.
- →Chromatography technique and Separation of Amino Acids.

BOTGDSE01: - ECONOMIC BOTANY BIOTECHNOLOGY

On completion of the course, students will be able to-

- →Understand the role plants in human welfare.
- →Gain knowledge about various plants of economic use
- →Know importance of plants & plant products
- →Understand the chemical contents of the plant products
- →Know about the utility of plant resources
- →Understand current status and future of biotechnology in India.
- →Gain knowledge of different instruments related to biotechnology.
- →Understand the importance of interdisciplinary and industrial approaches of

Biotechnology.

- →Recognize impact of biotechnology on socioeconomic aspects of life.
- →Develop the skills for employment or entrepreneurship.

BOTGDS01: -ECONOMIC BOTANY BIOTECHNOLOGY

PRACTICAL

After completing this, students will able to learn following things: -

- →Know about the utility of plant resources
- →Understand current status and future of biotechnology in India.
- →Gain knowledge of different instruments related to biotechnology.
- →Understand the importance of interdisciplinary and industrial approaches of Biotechnology.
- →Recognize impact of biotechnology on socioeconomic aspects of life. Develop the skills for employment or entrepreneurship.

BOTGDSE02 T: - Genetics, Cell and Molecular Biology

On completion of the course, students will be able to:

- →Gain knowledge about "Cell Science".
- →Understand Cell wall, Cell membrane, organelles and cell division.
- →Learn the scope and importance of molecular biology.
- →Understand the nature of biomolecules, their role in living systems. Understand the process of central dogma.

BOTGDSE02 P: - GENETICS, CELL AND MOLECULAR BIOLOGY

(PRACTICAL)

On completion of the course, students will be able to:

- →Gain knowledge about "Cell Science".
- →Understand Cell wall, Cell membrane, organelles and cell division.
- →Learn the scope and importance of molecular biology.
- →Understand the nature of biomolecules, their role in living systems. Understand the

process of central dogma.

BOTGSE01: - BIO -FERTILIZER

After completion of this course students will be able to learn and understand the following-

- →General account about the microbes used as bio fertilizer.

BOTGSE03: - ETHNOBOTANY

After completion of this course students will be able to learn and understand the following-

- →Know about the uses of traditional plants.

BOTGSE04: -PLANT DIVERSITY AND HUMAN WELFARE.

After completion of this course students will be able to learn and understand the following-

- →Bio-diversity information management and communication.

BOTHE02T: - PLANT ECOLOGY AND TAXONOMY

After completing this, students will able to learn following things: -

- →Understanding the role of different Ecological factors like Soil, Water, light and temperature; Origin, composition of soil profile; precipitation types, state of water in the environment, optimal-limiting factor of light and temperature.
- →Learning the Adaptive feature of Hydrophytes and Xerophytes.
- →Concept of Plant community, its characteristics, Ecotone, Edge Effect, succession.
- →Knowing about different phyto geographical zones of india, endemic plant species, hotspots.
- →Concept of Ecosystem, food web, food chain, bio geochemical cycles.
- →Learn the types of classifications- artificial, natural and phylogenetic.
- →Gain knowledge about ICN, botanical nomenclature, its rules and limitations.
- →Brief study of Herbarium techniques.
- →Understanding the Taxonomic evidences from molecular, numerical and chemicals.
- →Concept of taxonomic identification, morphological characters, family, botanical name.

BOTHGE 02(P): PLANT TAXONOMY AND ECOLOGY

(PRACTICAL)

After completion of this practical course, students will be able to learn and understand the following things: -

- →Study of instruments like thermometer, anemometer, hygrometer etc.
- →Concept of pH determination technique and rapid test technique.
- →Study of morphological adaptation of hydrophytes and xerophytes.
- →Principle and technique of determination of minimal quadrate size.
- →Gain knowledge about v.s. of flower, floral diagram, floral formula, ovary structure, systematic position of different families.

BOTHGE03T: -ECONOMIC BOTANY BIO TECHNOLOGY.

On completion of the course, students will be able to:

- →Understand the role plants in human welfare.
- →Gain knowledge about various plants of economic use
- →Know importance of plants & plant products
- →Understand the chemical contents of the plant products
- →Know about the utility of plant resources

BOTHGE04T: - PLANT PHYSIOLOGY AND METABOLISM

- After completing this, students will able to learn following things: -
- →Concept of Water potential; significance of Transpiration, Root Pressure, Guttation.
- →Significance of macro and micro elements in plant growth; brief idea of carrier, channels and pumps, active and passive transport.
- →Understand the process of Photosynthesis, Respiration and Nitrogen Metabolism.
- →Learn about sensory Photobiology
- →Know about the plant growth hormones (auxin , gibberellin, cytokinin, ethylene)
- →Understand the biosynthesis of terpenes, phenols, and nitrogenous compounds.
- →Learn about the mechanism of solute translocation, phloem loading–unloading method.
- →Know about dormancy, senescence and stress physiology.

BOTHE04P: - PLANT PHYSIOLOGY AND METABOLISM

(PRACTICAL)

After completion of this practical course students will be able to learn and understand the following things: -

- →Determination method of the osmotic potential of cell sap.
- →Effect of light and wind on Transpiration.
- →Principle of stomatal index and stomatal frequency calculation.
- →Process of Hill reaction.
- →Effect of Ph and enzyme conc. on Catalase activity.
- →Chromatography technique and Separation of Amino Acids.