PROGRAMME LEARNING OUTCOME
Bsc. (Hons) in Botany

Semester - 1
Core - 1
Paper Code : BOT5OIC (Theory), BOT5O1CP(Practical)
Paper Title : Viruses, Bacteria, Fungi and Plant Pathology
Learning Outcomes :
On Completion of this course, the student will gain knowledge and will be able to :

1) Characteristics, diversity, nutrition and importance of microbes.
2) To Classify viruses, bacteria, fungi and lichens based on their characteristics and structures.
3) Replication of viruses.
4) Bacterial reproduction and genetic recombination.
5) Reproduction and life cycle of representative species of different groups of fungi.
6) To develop critical understanding of plant diseases and their remediation.

Core - 2
Paper Code : BOT5O2C (Theory), BOT5O2CP(Practical)
Paper Title : Algae, Bryophytes, Pteriophytes and Gymnosperms.
Learning Outcomes :
On Completion of this course, the students will gain knownledge and will be able to :

1) To understand the classification, characteristic features, reproduction, life cyle patterns, biodiversity and economic importance of various groups of marine and fresh water algae.
2) To demonstrate an understanding of Bryophytes, Pteridophytes and Gymnosperms.
3) To develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms.
4) To understanding of plant evolution and their transition to lan habited.
5) To demonstrate proficiency in the experimental techniques and methods of appropriate analysis of Algae, Bryophytes, Pterdophytes, Gymnosperms.

Skill Enhancement Course (Sec -1):
Paper Code : BOT51O3C (Theory), BOT5O5CP(Practical)
Paper Title : Mushroom Cultivation.
Learning Outcomes :
On Completion of this courses, the students will gain knowledge of on be able to:

1) To identify various types and categories of mushrooms.
2) To demonstrate various types of mushroom cultivating technologies.
3) To value the economic factors associated with mushroom cultivation.
4) To device new methods and strategies to contribute to mushroom production.

Semester - II
Core - 3
Paper Code : BOT51O3C (Theory), BOT5O5CP(Practical)
Paper Title : Plant Systematics.
Learning Outcomes :
Students understand plant classification , phylogeny and identification with nomenclatural rules :

1) To classify plant systematices and recognize the importance of herbarium and virtual herbium.
2) To evaluate the important herbarium and botanical gardens.
3) To interput the rules of ICN in botanical nomenclature**.**
4) To assess terms and concepts related to phylogenetic.
5) To generalize the characters of the families according to Bentham & Hooker's system of classification.

Core- 4
Paper Code : BOT51O4C (Theory), BOT5O4CP(Practical)
Paper Title : Biomolecules and Cell Biology.
Learning Outcomes :
On Completion of this course, the students will be abel to :

1. To develop understanding on chemical bonding among molecules.
2.To identify the concept that explains chemical composition and structure of cell wall and membrane.
3. To classify the enzymes and explain mechanism of action and structure.
4. To compare the structure and function of cells and to explain the developmenrt of cells.
5. To describe the relationship between the structure and function of biomolecules. Key words : Nucleic Acids, Amino Acids, Proteins, Lipids, Fatty Acids, Signal Transduction.

Skill Enhancement Course (SEC -2)
Paper Code : BOT 5O2 S (b) (Theory), BOT 5O2 SP (b) (Practical)
Paper Title : Nursery and Gardening.
Learning Outcomes :
On Completion of this course the students will be abe to :

1) To understand the process of sowing seeds in nursery.
2) To list the various resources required for the development of nursery.
3) To distinguish among the different forms of sowing and growing plants.
4) To analyse the process of vegetative propagation.
5) To appreciate the diversity of plants and selection of gardening.
6) To examine the cultivation of different vegetables and growth of plants in nursing and gardening.

Semester - III

Core -5

Paper Code : BOT 6O5 C (Theory), BOT 6O5 CP (Practical)

Paper Title : Plant Metabolism.

Learning Outcomes :

On completion of this course, the students will gain knowledge and will be able to :

1) To differentiate anabolic and catabolic pathways of metabolism.
2) To learn the similarity and differences in metabolic pathways in animals and plants.
3) To recognize the importance of carbon fixation and assimilation in plants.
4) To explain the ATP-Synthesis.
5) To interpret the Biological nitrogen fixation in metabolism.
6) To grasp the concept of signal reception and transduction in a cell.

Core -6

Paper Code : BOT 6O6 C (Theory), BOT 6O6 CP (Practical)

Paper Title : Ecology and Phytogeography.

Learning Outcomes :

On completion of this course, students will given knowledge and will be able to :

1) To understand the complex interrelationship between organisms and environment.
2) To acquire knowledge on different methods for vegetation analysis.
3) To evaluate community patterns and processes including ecosystem functions.
4) To understand evolving strategies for sustainable natural resource management and biodiversity conservation.
5) To attain knowledge on principles of phytogeography and plant endemism.
6) To gain practical knowledge on different instruments used for analyzing soil and climate variables.
7) To conduct qualitative and quantitative analysis for different parameters both soil and water.

CORE -7

Paper Code : BOT 6O7 C (Theory), BOT 6O7 CP (Practical)

Paper Title : Genetics and Cytogenetics.

Learning Outcomes :

On completion of this course, the students will gain knowledge and will be able to :

1) To have conceptual understanding of laws of inheritance, genetic basis of loci and alleles and their linkage.
2) To comprehend the effect of chromosomal abnormalities in numerical as well as structural changes leading to genetic disorders.
3) To develop critical understanding of chemical basis of genes and their interactions at population and evolutionary levels.
4) To analyze the effect of mutations on gene functions and dosage.

5) To examine the structure, functions and replication of DNA.

Generic Elective Course (GEC-1)
Paper Code : 6O1 G (C) (Theory) and BOT 6O1 GP (c) (Practical)
Learning Outcomes :
On completion of this course, the students will gain knowledge and will be able to :

1) To identify important medicinal and aromatic plants.
2) To apply techniques of conservation and propagation of medicinal and aromatic plants.
3) To setup process of harvesting, drying and storage of medicinal herbs.
4) To comprehend the extraction methods of essential oils from aromatic plants.
5) To propose new strategies to enhance growth of medicinal herbs considering the practical issues pertinent to India.

Semester - IV
Core - 8
Paper Code : BOT 6O8 C (Theory), BOT 6O8 CP (Practical)
Paper Title : Economic Botany and Plant Resource Utilization.
Learning Outcomes :
On completion of this course, the students will gain knowledge and will be able to :

1) To understand the core concept of economic Botany and its relationship with environment and society.
2) To develop first-hand information of plants used as food, the various kinds of nutrients available in the plants.
3) To understand the dietary requirements of proteins, fats, amino-acids, vitamins etc that can be met by plants.
4) To learn to perform the micro-chemical test to demonstrate various components.
5) To learn about the use of fiber plants, beverage, fruits and vegetables that are integral to day to day life of plants.
6) To learn to explore the regional diversity in food crops and other plants and their ethnobotanical importance as well.

Core - 9
Paper Code : BOT 6O9 C (Theory), BOT 6O9 CP (Practical)
Paper Title : Molecular Biology.
Learning Outcomes :
On completion of this course, the students will gain knowledge and able to

1) To develop an understanding of nucleic acid, organization of DNA in prokaryotes and eukaryotes, DNA replication mechanism, genetic code and transcription process.
2) To understand the mechanisms involved in processing and modification of RNA and translation process, function and regulation of expression.

3) To gain insights into the application in biotechnology in plant, animal and microbial sciences.

Core - 10
Paper Code : BOT 610 C (Theory), BOT 610 CP (Practical)
Paper Title : Plant morphology and Anatomy.
Learning Outcomes :

1) To develop an understanding of concepts and fundamentals of plant morphology and anatomy.
2) To use various morphological terminologies while describing a plant.
3) To understand the knowledge of various cells and tissues, meristems, epidermal and vascular tissue system in plants.
4) To develop critical understanding on the evolution of concept of organization of shoot and root apex.
5) To correlate the anatomical structure with morphology and functions.
6) To analyze the composition of different parts of plants and their relationships.
7) To evaluate the adaptive and protective systems of plants.

Generic Elective Course (Gec-2)
Paper Code : BOT 602 G (a) (Theory) & BOT 602 GP (a) (Practical)
Paper Title : Seed Technology.
Learning Outcomes :
After completion of the course, the students will able to :

1) To understand the theoretical orientation of seed development.
2) To analyse the different ways of seed processing in different plants.
3) To examine the various methods of seed testing.
4) To understand the method of seed production in different plants.
5) To explain the concept of hybrid seed production.

Semester v
Core - 11
Paper Code : BOT 711C (Theory) & BOT 711 CP (Practical)
Paper Title : Reproductive Biology of Angiosperms.
Learning outcomes :
On completion of this course, the students will be able to :

1) To recall the history of reproductive biology of angiosperms and recognize the importance of genetic and molecular aspects of flower development.
2) To understand of genetic and molecular aspects of flower development.
3) To evaluate the special structures of ovule.
4) To evaluate the special structures of ovule.
5) To comprehend the causes of polyembryony and apomixes with its classification.

Core - 12
Paper Code : BOT 712C (Theory) & BOT 712 CP (Practical)
Core Course : Plant Physiology.
Learning outcomes :
On completion of this course, the students will be able to :

1) To understand water relation of plants with respect to various physiological process.
2) To explain chemical properties and deficiency symptoms of mineral elements in plants.
3) To realize the role of hormones in plant growth and development and their applications in agriculture and horticulture.
4) To understand the role of light in various development process such as flowering, germination and dormancy.
5) To understand transport mechanisms and translocation in the phloem.
6) To appreciate the commercial application of plant physiology.

Discipline Specific Elective Course (DSE-1)
Paper Code : BOT 701 D (c) (Theory) & BOT 701 DP (Practical)
Paper Title : Plant Pathology
Learning outcomes :
On completion of this course, students will be able to :

1) To understand the concept of plant pathology and its related terminologies and disease causing organisms.
2) Identification of important crop disease, crop disease management using chemical pesticides and other practices.

Generic Elective Course (GEC-3)
Paper Code : BOT 703 G (b) (Theory) & BOT 703 GP (b) (Practical)
Paper Title : Global Climate Change.
Learning outcomes :
After completing this course the learner will be able to :

1) To develop understanding on the concept and issues of global environment change.
2) To analyze the causes and effects of depletion of stratospheric ozone layer.
3) To examine the change and its effect on living beings.
4) To understand the physical basis of natural green gashouse effect on man and materials.
5) To evaluate human influenced driver of our climate system and its application.

Semester - VI
Core - 13
Paper Code : BOT 713 C (Theory) & BOT 713 CP (Practical)
Paper Title : Biostatistics and Bioinformatics.
Learning outcomes :
On completion of this course, the students will gain knowledge and able to :

1) To understand subject matter and relevance of statistics and bioinformatics to biological sciences.
2) To understand the classification and structuring of biological data.
3) To understand the construction of histogram and frequency distribution table.
4) To understand the numerical calculation, procedure of location and variability of data.
5) To understand the logic behind probability and probability distribution models in biology.
6) To understand the importance of hardware and software tools in accessing and retrieving bio logical data through internet.
7) To understand the relevance and development of bioinformatics in biology.
8) To know the use of basic tools involve in understanding bioinformatics.
9) To know the importance of biological databases in sequencing nucleic acid and proteins.

Core - 14
Paper Code : BOT 714 C (Theory) & BOT 714 CP (Practical)
Paper Title : Plant Biotechnology.
Learning outcomes :
On completion of this course, the students will gain knowledge and able to :

1) To learn the basic concepts, principles and processes in plant biotechnology.
2) To explain the concepts, principles and usage of the acquired knowledge in biotechnological, pharmaceutical, medical, ecological and agricultural applications.
3) To use basic biotechnological techniques to explore molecular biology of plants.
4) To explain how biotechnology is used to for plant improvement and to discuss the biosafety concern and ethical issue of that use.

Discipline specific elective course (DSE-2)
Paper Code : BOT 702 D (c) (Theory) & BOT 702 DP (c) (Practical)
Paper Title : Post-Harvest Technology.
Learning outcomes :
On completion of this course, the students will gain knowledge and able to :

1) To comprehend engineering properties/various post-harvest process on agriculture produce and its applications.
2) To determine various properties & parameters of Agriculture produce.

3) To evaluate engineering properties / management of storage structures and losses during storage agriculture produce.

Generic Elective Course (GEC-4)

Paper Code : BOT 704 G (a) (Theory) & BOT 704 (a) (Practical)

Paper Title : Biodiversity.

Learning outcomes :

On completion of this course, the students will gain knowledge and able to :

1) To understand the fundamental concepts related to biodiversity and its conservation.
2) To understand the general characteristics and diversity of microbial forms.
3) To understand the general characteristics and diversity of alge, bryophytes and pteridophytes.
4) To understand the general characteristics and diversity of gymnosperms and angiosperms.

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