

DEPARTMENT OF BOTANY

PROGRAMME NAME: B.SC (BOTANY)

Programme outcomes

PO1: Critical Thinking: Demonstrate and apply the fundamental knowledge of the basic principles of major fields of biology. Apply the knowledge to solve the issues related to plant sciences with the help of computer technology.

PO2: Environment and Sustainability: Study the range of plant diversity in terms of structure, function and environmental relationships. The gained knowledge is applied for conservation of indigenous, medicinal, endemic and endangered plant species. Also, emphasize the significance of clean environment for preservation and sustainable utilization of biodiversity.

PO3: Social responsibility: develop ethics in work and reverence for self and others.

PO4: Integrity development: Convey and practice to follow the social, environmental and biological ethics.

PO5: Intellectual skills development: Effective assignment of scientific information in both orally and in writing to develop logically thinking and organizing tasks into a structured form. Assimilate the knowledge and ideas based on wide reading and through the internet.

PO6: Practical skills: On field and laboratory practical knowledge were applied to interpreting the plant morphology, identification of plants, anatomy and vegetation analysis. The analysis of plant materials in the context of plant physiology and biochemistry. Analyze the data using statistical methods or software.

PO7: Scientific skill development: Knowledge is applied to understand the scientific problem in life science and fundamental metabolism of plants. Formulate the research literature and understand the problem in different fields of plant science.

Programme specific outcomes

PSO1: Collaborate effectively on team-oriented projects in the field of life

- sciences.
- PSO2:** Communicate scientific information in a clear and concise manner both orally and in writing
- PSO3:** Explain Biodiversity, climate change and plant pathology.
- PSO4:** Apply Biotechnology, Ecology, Genetics and Plant breeding techniques in plant sciences
- PSO5:** Apply knowledge of Medicinal and Economic botany in day to day life.
- PSO6:** Apply the knowledge to develop the sustainable and eco-friendly technology in Industrial Botany.

Course outcomes

First Year (2019 pattern)

SEM I

Course: Plant life and utilization I (BO111)

CO1: Understand the kingdom classification systems of living things **CO2:**

Become aware of the status of cryptogams as a group in plant kingdom.

CO3: Discuss about morphological structure, classification and reproduction of thallophytes (Algae, Fungi, Lichens) and Bryophytes.

CO4: Understand the life cycles of selected genera of thallophytes (Algae, Fungi, Lichens) and Bryophytes

CO5: Economic and ecological importance of Algae, fungi, Lichens and Bryophytes.

Course: Plant morphology and Anatomy (BO112)

CO1: Understand the importance of plant morphology in allied branches of botany

CO2: Students get an idea about various floral whorl and its importance in plant reproduction

CO3: Students study the role of anatomy in other allied branches of botany

CO4: Student know about the different tissues present in plant their structure

and role.

CO5: understand the differences in internal organization of two distinct plant group and plant parts

SEM II

Course: Plant life and utilization II (BO121)

CO1: Become aware of the status of vascular plants as a group in plant kingdom.

CO2: Discuss about morphological structure, classification and reproduction of pteridophytes and gymnosperms.

CO3: Understand the life cycles of selected genera of pteridophytes and gymnosperms

CO4: Economic and ecological importance of pteridophytes and Gymnosperms

CO5: Understand the morphological differences in dicot and monocot and their classification

CO6: Knows the value of angiosperm in various industries such as food, fodder and fiber

Course: Principles of Plant Science (BO122)

CO1: Understanding the scope and importance of plant physiology. **CO2:** Demonstrate processes imbibition, Osmosis, Diffusion and Plasmolysis **CO3:** Describe Plant growth regulators and their types.

CO4: Discuss the structure of plant cell and Plasma membrane and cell cycle in plants

CO5: Explain the scope and importance of molecular biology. **CO6:** Describe the structure of DNA, Packing of DNA and types of DNA, RNA.

CO7: Explain the DNA replication process, enzymes involved in that process.

Second Year (2013 pattern)

SEM I

Course Paper I: Taxonomy of Angiosperm and Plant Community (BO – 211)

CO1: Students will learn the application of morphology in plant identification, classification and nomenclature

CO2: Students learn Plant collection, preservation techniques and can identify

plant in field.

CO3: Students get aware about various recent computerized tools used in plant research

CO4: Students will know how the vegetation pattern change in different ecosystem

CO5: Students will learn the techniques of vegetation studies and its application

Course Paper II Plant Physiology

CO1: Define the terminologies: Plant water relations, Growth, Transpiration, Ascent of Sap, Plant growth regulators and Nitrogen metabolism. **CO2:** Explain processes of mineral nutrition, absorption of water, ascent of sap, mechanisms of water loss from plants.

CO3: Demonstrate processes imbibition, Osmosis, Diffusion and Plasmolysis, measure growth by arc auxanometer, Bose Cresco graph.

CO4: Describe Plant growth regulators and their types and Discuss nitrogen metabolism in plants

CO5: Explain mechanisms and application of photoperiodism, vernalisation and classify the plants based on Photoperiodism.

SEM II

Course Paper I: Plant Anatomy, Embryology and Palynology (BO

213) CO1: Define terms related to plant Anatomy, Embryology.

CO2: Describe various tissue systems in plants like epidermal, mechanical and vascular.

Course Paper II: Plant Biotechnology (BO 242)

CO1: Students will come to know various applications of Plant Biotechnology.

CO2: Uses of Plants and Fungi in enzyme technology-based industries **CO3:**

Uses fungi and plant substrates in fermentation industries **CO4:** Single cell protein manufacturing process

CO5: Basic knowledge & applications of plant genetic engineering

CO6: Bio-nano technology and its applications in Agriculture

Third Year

Course Paper - I Cryptogamic Botany (BO-331)

CO1 Students should know characters of Cryptogams

CO2 To inform Chapman and Chapman system of classification used for cryptogams.

CO3 To introduce life cycle of *Rhizopus*, *Saccaromyces*, *Puccinia* and *Cercospora*

CO4 To give knowledge about Bryophytes and Pteridophytes CO5 To introduce life –cycle of *Marchantia*, *Anthoceros*, *Polytrichum*, *Psilotum*, *Selaginella* and *Marsilea*.

Course Paper – I Cell and molecular biology (BO-332)

CO1 Define terminologies related to cell and molecular biology.

CO2 Identify localization and describe all cell organelles.

CO3 Discuss the dynamics of plant cell structure and function.

CO4 Describe Nucleus and chromosomes.

CO5 Describe DNA replication, Transcription and Translation. CO6 Explain the concepts as well as mechanisms of damage and repair. CO7 Explain gene action and regulation (concept of operon, its structure and regulation).

CO8 Interpret the genomic organization and its role in gene expression

Course Paper III- Genetics and Evolution (BO-333)

CO1 Students will understand the genetic terminology of genetics and laws of mendelism.

CO2 Students will understand and solve the various example of interaction of genes and multiple alleles

CO3 Students will able to construction of linkage map by test cross CO4 Student get idea and easily differentiate various types of inheritance and structural changes in chromosome.

CO 5 Understanding the concept, Evidences of Evolution and population genetics.

Course-Paper – IV Spermatophyta and Paleobotany (BO – 334)

CO1 Students will know about the different members of higher plant group (Phanerogams) when they see and they can make systematics of them

CO2 Studying plant family's helps students understand plant composition in natural communities

CO3 Study of economical use of families helps to understand potential of plants in various industries

CO4 Students will understand the pattern of higher plant evolution over the time period

CO5 Students learn to handle various tools used in plant identification in laboratory as well as in field.

Course Paper - V Horticulture and Floriculture (BO-335) CO1 Students will understand the importance of Horticulture and Horticulture zones of Maharashtra and India.

CO2 Students will understand branches of Horticulture on the basis of uses, climatic condition, life cycle pattern of plants.

CO3 Students will learn techniques of artificial and natural propagation. CO4 Student get idea about various treatments for changing flowering season according demand in the market.

CO5 To give information about types of gardens and floriculture technology.CO1

Course Paper - VI Computational Botany (BO-336)

CO1 Students should be able to state the claim or hypothesis clearly by using experimental data.

CO2 Students have to condense the data into systematic manner i.e. in tabular form.

CO3 Students should able to represent data which is in tabular form into various graphical methods.

CO4 Use of different scales or measurements related to centrality, viability and symmetry of data.

CO5 Students should know statistical problem solving based on co-relation and regression, testing of hypothesis.
