

<b>Department of Botany</b>
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Programme Name: BSc Botany
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**Programme outcomes**

- PO1 Demonstrate and apply the fundamental knowledge of the basic principles of major fields of biology
- PO2 Apply knowledge to solve the issues related to plant sciences with the help of computer technology
- PO3 Apply knowledge for conservation of endemic and endangered plant species

**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.

<b>Course outcomes</b>
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<b>First Year</b>
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**SEM I****Course : Plant life and utilization I (BO111)**

- CO1 Students understand the diversity of lower plant and their distinct features.
- CO2 Understand the algal diversity and its industrial application
- CO3 knows about distinct classes of Lichen and their utilization
- CO4 Understand the Fungal diversity and their application in various industries. Also know how to Cultivate the mushroom and their values.
- CO5 Knows about character, classification and utilization of bryophyte at industrial level

**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 Students understand the differences in higher plant structure
- CO2 Knows the different characters in Pteridophytes and their uses
- CO3 Know the distinct features of gymnosperm, structure of *Cycas* and their economic potential
- CO4 Understand the morphological differences in dicot and monocot and their classification
- CO5 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

## 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.
- CO3 Interpret the Principles involved in distribution of mechanical tissues.
- CO4 Explain the process of normal and abnormal secondary growth in plants.
- CO5 Differentiate between normal and abnormal secondary growth.
- CO6 Identify the process of pollination and fertilization.
- CO7 Discuss the Structure and development process of male and female gametophyte
- CO8 Illustrate the types of microspore, ovules, embryo, seed and endosperm.

#### **Course Paper II: Plant Biotechnology (BO 213)**

- CO1 Define the terminologies related to plant biotechnology.
- CO2 Describe the fermentation process.
- CO3 Explain enzyme technology and their industrial scale production.
- CO4 Interpret the production of Single cell proteins.
- CO5 Illustrate the concept of phytoremediation.
- CO6 Describe General method of gene isolation from the plants and their application.
- CO7 Explain Methods of gene, transfer in plants.
- CO8 Illustrate Application of plant genetic engineering and Nano-biotechnology in crop improvement.

### 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 Pterodophytes
- 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.

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