

• Department of Botany

□ Course Outcomes:

□ F Y B Sc.

• Semester -1

BOT.111: BACTERIA, VIRUSES AND ALGAE	<ul style="list-style-type: none">• Understand the diversity among Bacteria, Viruses and Algae.• Know the systematic, morphology and structure, of Bacteria, Viruses and Algae.• Understand the life cycle pattern of Bacteria, Viruses and Algae.• Understand the useful and harmful activities of Bacteria, Viruses and Algae.
BOT.112: PLANTS FOR HUMAN WELFARE	<ul style="list-style-type: none">• Understand the Biodiversity of Fungi.• Know the Economic Importance of Fungi.• Understand the features of Lichens.• Know the terminologies in plant pathology.• Understand the scope and importance of Plant Pathology.• Know the control measures of plant diseases.
BOT:103 PRACTICAL COURSE	Students should understand : <ul style="list-style-type: none">• Gram staining of Bacteria• Study of Bacterial Disease w.r.t. Causal organism, Symptoms and control measures.• Study of viral diseases w. r. t. Causal organism and Symptoms.• Study of Algal diversity w.r.t Systematic position and morphology.• Study of Life cycle of Spirogyra and Sargassum.• Know botanical source/s, characteristics and utilities of Plants/ plant products.

• Semester -2

BOT.121: FUNGI, LICHENS AND PLANT PATHOLOGY	<ul style="list-style-type: none">• Understand the Biodiversity of Fungi.• Know the Economic Importance of Fungi.• Understand the features of Lichens.• Know the terminologies in plant pathology.• Understand the scope and importance of Plant Pathology.• Know the control measures of plant diseases.
BOT.122: INDUSTRIAL BOTANY	<ul style="list-style-type: none">• Gain thorough knowledge about various plant groups from primitive to highly evolved plants.• Become aware of applications of different plants in various industries.• To highlight the potential of these studies to become an entrepreneur.• To equip the students with skills related to laboratory as well as industries based studies.• To make the students aware about conservation and sustainable use of plants.• To address the socio-economic challenges related to plant sciences.

BOT:103: PRACTICAL COURSE

Students should understand

- Study of fungal diversity w.r.t Systematic position and morphology.
 - Study of life cycle of *Rhizopus* and *Agaricus*.
 - Study of Lichens and its types.
 - Study of plant diseases w.r.t. causal organisms, symptoms and control measure.
 - Cultivation of Mass culture of B.G.A. and Pleurotus.
 - Identify the botanical source, plant part used and uses of rubber.
 - Preparation of bio pesticide Azadiractin , Squash and Ketchup.
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- S Y BSc.

- Semester-1

BOT 231: BRYOPHYTES AND PTERIDOPHYTES	<ul style="list-style-type: none">• Understand the morphological diversity of Bryophytes and Pteridophytes.• Understand the economic importance of the Bryophytes and Pteridophytes.• Know the evolution of Bryophytes and Pteridophytes.
BOT.232 : MORPHOLOGY OF ANGIOSPERMS	<ul style="list-style-type: none">• Understand the habit of the angiosperm plant body.• Know the vegetative characteristics of the plant.• Learn about the reproductive characteristics of the plant.• Understand the plant morphology.
BOT. 233: PRACTICAL COURSE	Students should understand, <ul style="list-style-type: none">• Study of diversity of Bryophytes and Pteridophytes w.r.t systematic position and morphology.• Study of life cycle of <i>Riccia</i>, <i>Funaria</i>, <i>Selaginella</i> and <i>Adiantum</i>.• Morphology of root and stem with its modification.• Morphology of Leaf and its modification.• Study of Flower morphology , Inflorescence and its types of Inflorescence.• Study fruit Morphology and types.

- Semester-2

BOT. 241: PLANT PHYSIOLOGY	<ul style="list-style-type: none">• Know importance and scope of plant physiology.• To understand the plants and plant cells in relation to water.• Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways.• Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.• Learn about the movement of sap and absorption of water in plant body.• Understand the plant movements.
BOT.242: TAXONOMY OF ANGIOSPERMS	<ul style="list-style-type: none">• Understand the diversity of angiosperms.• Understand the comparative account among the families of angiosperms.• Know the economic importance of the angiosperm plants.• Understand the distinguishing features of angiosperm families.

BOT.-243: PRACTICAL COURSE

Students should understand,

- Determine the DPD by using the potato tuber
- To determine the rate of photosynthesis
- Determination of RQ using Ganong's respirometer
- Osmosis by curling experiment, Imbibition pressure, Thistle funnel, Ringing experiment, Relative transpiration, CO₂ Necessary for photosynthesis, Kuhen's Tube experiment, Cyclosis in Hydrilla
- Study of Plant families w.r.t Systematic position, Morphological characters, floral formula and floral diagram.
- Preparation of artificial key .

- **T Y B Sc.**

- **Semester -1**

BOT. 351, PAPER – I CRYPTOGRAMS	<ul style="list-style-type: none">• Know the salient features of Cryptogams plants.• Become aware of the status of cryptogams as a group in plant kingdom.• Understand the life cycles of selected genera.• Learn about the economic and ecological importance of Cryptogams plants.
BOT.352 - ANGIOSPERM TAXONOMY	<ul style="list-style-type: none">• Understand the status of angiosperms in plant kingdom.• Realize the origin of Angiosperms with respect to time, place, origin and probable ancestors.• Know the Pre-Darwinian and Post- Darwinian systems of Classification.• Understand various angiosperm families emphasizing their morphology, distinctive features and biology.• Know the role of cytology and Phytochemistry in Taxonomy..
BOT. 353 - III GENETICS AND MOLECULAR BIOLOGY	<ul style="list-style-type: none">• Gain knowledge about “Cell Science.• Understand Cell wall Plasma membrane, Cell organelles and cell division.• Learn the scope and importance of molecular biology.• Understand the biochemical nature of nucleic acids, their role in living systems, experimental evidences to prove DNA as a genetic material.• Understand the process of synthesis of proteins and role of genetic code in polypeptide formation .
BOT.354 -PAPER-IV ADVANCED PLANT PHYSIOLOGY	<ul style="list-style-type: none">• Learn and understand about mineral nutrition in plants.• Understand the growth and developmental processes in plants.• Know about movement in plants.• Understand the process of translocation of solutes in plants.• Know the nitrogen metabolism and its importance.
BOT.355 - PLANT ECOLOGY AND PHYTOGEOGRAPHY	<ul style="list-style-type: none">• Know the scope and importance of the discipline.• Understand plant communities and ecological adaptations in plants.• Learn about conservation of biodiversity, Non-conventional Energy and Pollution.• Discover botanical regions of India and vegetation types of Maharashtra.

	<ul style="list-style-type: none"> • Understand Bioremediation, Global warming and climate change.
BOT.356.3 GARDENING	<ul style="list-style-type: none"> • To know the concept of garden. • To study the special types of gardens. • To study different features of garden. • To study the different ornamental garden plants. • To understand technique of pot culture, Bonsai, Topiary & Lawn.
BOT. 357:PRACTICAL PAPER I	<p>Students should understand,</p> <ul style="list-style-type: none"> • The range of thallus structure in algae . • The life cycle of <i>Chara, Uncinula, Marchantia and Marselia</i>. • The types of stele in Pteridophytes . • Preparation of fixative and stains • The Mitosis and Meiosis techniques. • Study of polytene chromosome from Chironomus larvae. • Isolation of DNA from any plant material. • Mitochondrial staining by Janus green stain.
BOT. 358: PRACTICAL PAPER II	<p>Student should understand,</p> <ul style="list-style-type: none"> • Study of plant families representing different groups of angiosperms w.r.t systematic position, morphological characters, floral formula and floral diagram. • Using local, regional, state and national flora. • Principle working and uses of laminar air flow hood, autoclave, hot air oven, electrophoresis and centrifuge. • MS media preparation.
BOT. 359: PRACTICAL PAPER III	<p>Students should understand,</p> <ul style="list-style-type: none"> • Qualitative assessment of microelements in plant ash • Effect of hormone on germinating seeds. • To determine the minimum size of the quadrat by 'species area curve method'. • Soil texture, water holding capacity, pH, and test for carbonate, nitrate, and sulphate. • Demonstration, working and uses of ecological instruments. • Study of morphological and anatomical adaptation in locally available hydrophyte and Xerophyte. • Measurement of water quality based on – hardness, Dissolved oxygen, free CO₂, Chloride, Total alkalinity.

• **Semester -2**

BOT. 361 - GYMNOSPERMS &

- Understand Gymnosperms with respect to

PALEOBOTANY	<p>distinguishing characters, comparison with Angiosperms, economic importance and classification.</p> <ul style="list-style-type: none"> • Understand the life cycles of Pinus and Gnetum. • Know the scope of Paleobotany, types of fossils and geological time scale • Understand the various fossil genera representing different fossil groups.
BOT. 362 - ANATOMY AND EMBRYOLOGY	<ul style="list-style-type: none"> • Understand the scope & importance of Anatomy and Embryology. • Know various tissues systems. • Understand the normal and anomalous secondary growth in plants and their causes. • Perform the techniques in anatomy.. • Understand structure and development in microsporangium and megasporangium. • Understand microsporogenesis and megasporogenesis. • Understand male and female gametophytes. • Know fertilization, endosperm and embryogeny.
BOT : 363 GENETICS, PLANT BREEDING AND EVOLUTION	<ul style="list-style-type: none"> • Understand the “Science of Heredity”. • Realize the role of genes in evolution of species. • To understand linkage, segregation and mutation of genes during evolution. • Understand the science of plant breeding. • To introduce the student with branch of plant breeding for the survival of human being from starvation. • To study the techniques of production of new superior crop varieties. • To study the evolution in living organisms.
BOT- 364 PLANT BIOCHEMISTRY	<ul style="list-style-type: none"> • Understand the current status of Biochemistry. • Recognize the impact of Biochemistry on socioeconomic aspects of life. • Realize the industrial application of Biochemistry • Understand the importance of Bio -molecules.
BOT 365 -APPLIED BOTANY	<ul style="list-style-type: none"> • Understand the importance and scope of botanical science in the industries. • Understand the role of microbial plants in fermentations process. • Know the process of cultivation of cash crops. • Understand some plants which are used as herbal cosmetics. • Understand technique of plant tissue culture and its application. • Realize the role plants in forensic science.

BOT 366.3 : HORTICULTURE	<ul style="list-style-type: none"> • To understand scope , importance & disciplines of horticulture. • To familiar with horticultural zone of Maharashtra & India. • To understand different horticultural practices & methods. • To study role played by green & playhouses in horticulture. • To understand production technology, harvesting technics. • To understand methods of preservation & preparation of preserve product.
BOT- 367: PRACTICAL PAPER -I	<p>Students should understand,</p> <ul style="list-style-type: none"> • Study of <i>Pinus</i> & <i>Gnetum</i>. • Study of different types of fossils. • Solving of problems on monohybrid and dihybrid cross. • Isolation of DNA from suitable plant material. • Study of factors promoting self -pollination & cross pollination. • Techniques of Hybridization in Self Pollinated and Cross Pollinated Crops. • Methods of estimation of Heterosis
BOT- 368: PRACTICAL PAPER -II	<p>Students should understand,</p> <ul style="list-style-type: none"> • Study of epidermal tissue system and mechanical tissue system • Study of normal secondary growth in stem and root of woody dicots. • Study of anomalous secondary growth in the stem of the Plants. • Maceration of vascular tissue. • Study of Garden tools and Equipments. • Study of Phenology of fruits, vegetables or flowering crops. • Preparation of different types of fruit products & Food products.
BOT- 369: PRACTICAL PAPER -III	<p>Students should understand,</p> <ul style="list-style-type: none"> • To study the effect of temperature on activity of enzyme amylase. • To study the principle and working and uses of spectrophotometer, calorimeter, centrifuge , Autoclave, Laminar air flow, Hot air oven, Incubator etc. • Isolation and estimation of lipids from oil seeds by using Soxhlet apparatus. • To study the lipase activity by using germinating oily seeds. • Detection of adulteration in plant products using

	suitable tests. <ul style="list-style-type: none">• Preparation of Aloe vera gel & Jaswandjel.• Botanical name and uses of plant material in forensic science

