

RAYAT SHIKSHAN SANSTHA'S  
**SHREE SADGURU GANGAGEER MAHARAJ SCINCE, GAUTAM ARTS & SANJIVANI  
COMMERCE COLLEGE, KOPARGAON DIST AHMEDNAGAR**

**Program Outcomes, Program Specific Outcomes and Course Outcome**

**Department of Botany**

<b>Program Outcome :B.Sc. (Botany)</b>	
PO1	<ul style="list-style-type: none"><li>• Students know about different types of lower &amp; higher plants their evolution in from algae to angiosperm &amp; also their economic and ecological importance.</li></ul>
PO2	<ul style="list-style-type: none"><li>• Cell biology gives knowledge about cell organelles &amp; their functions</li></ul>
PO3	<ul style="list-style-type: none"><li>• Molecular biology gives knowledge about chemical properties of nucleic acid and their role in living systems.</li></ul>
PO4	<ul style="list-style-type: none"><li>• Genetics provides knowledge about laws of inheritance, various genetic interactions, chromosomal aberrations &amp; multiple alleles.</li></ul>
PO5	<ul style="list-style-type: none"><li>• Structural changes in chromosomes.</li></ul>
PO6	<ul style="list-style-type: none"><li>• Student can describe morphological &amp; reproductive characters of plant and also identified different plant families and classification.</li></ul>
PO7	<ul style="list-style-type: none"><li>• They know economic importance of various plant products &amp; artificial methods of plant propagation</li></ul>
PO8	<ul style="list-style-type: none"><li>• Use modern Botanical techniques and decent equipments.</li></ul>
PO9	<ul style="list-style-type: none"><li>• To inculcate the scientific temperament in the students and outside the scientific community</li></ul>
PO10	<ul style="list-style-type: none"><li>• Industrial Botany: By studying this course students can apply this knowledge in various industries such as Mushroom cultivation, biofertilizer production, biopesticide, etc. They can also set up their own industries.</li></ul>

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**Program Outcomes, Program Specific Outcomes and Course Outcome**

**Department of Botany**

<b>Program Specific outcome: B.Sc. (Botany)</b>	
PSO1	<ul style="list-style-type: none"><li>• Students acquire fundamental Botanical knowledge through theory and practical's.</li></ul>
PSO2	<ul style="list-style-type: none"><li>• To explain basis plant of life, reproduction and their survival in nature. PSO-3. Helped to understand role of living and fossil plants in our life.</li></ul>
PSO4	<ul style="list-style-type: none"><li>• Understand good laboratory practices and safety.</li></ul>
PSO5	<ul style="list-style-type: none"><li>• To create awareness about cultivation, conservation and sustainable utilization of biodiversity.</li></ul>
PSO6	<ul style="list-style-type: none"><li>• To know advance techniques in plant sciences like tissue culture, Phytoremediation, plant disease management, formulation of new herbal drugs etc.</li></ul>
PSO7	<ul style="list-style-type: none"><li>• Students able to start nursery, mushroom cultivation, biofertilizer production, fruit preservation and horticultural practices</li></ul>

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**Program Outcomes, Program Specific Outcomes and Course Outcome**  
**Department of Botany**  
**Course Outcomes of B.Sc. (Subject)**

<b>Class</b>	<b>Course title</b>	<b>Outcome</b>
F.Y.B.Sc. (Paper-I)	Fundamentals of Botany	<ul style="list-style-type: none"> <li>• Study of morphology &amp; Anatomy of lower plants</li> <li>• Know about life cycle of different plant groups i.e. cryptogams and phanerogams</li> <li>• Evolutionary study of plants</li> <li>• Study of Classification of plants</li> </ul>
F.Y.B.Sc. (Paper-II)	Industrial Botany	<ul style="list-style-type: none"> <li>• Introduction to plant resources</li> <li>• Floriculture industry – study of important floriculture crops, Green house technology, cultivation practices</li> <li>• Concept and types of nursery and propagation methods</li> <li>• Study of plant tissue culture industry</li> <li>• Study of organic farming, Seed industries</li> <li>• Study of Mushroom cultivation and commercial production</li> </ul>
F.Y.B.Sc. (Paper-III)	Practical based on theory paper I& II	<ul style="list-style-type: none"> <li>• Study of anatomy and morphology of different plants</li> <li>• Study of artificial plant propagation techniques</li> <li>• Study of techniques in plant tissue culture</li> <li>• Cultivation of mushrooms</li> <li>• Study of biofertilizers and biopesticides</li> <li>• Preparation of jams, squash,etc.</li> </ul>
F.Y.B.Sc. (Paper-I)	Fundamentals of Botany	<ul style="list-style-type: none"> <li>• Study of morphology &amp; Anatomy of higher plants</li> <li>• Know about different types of inflorescences and parts of typical flower</li> <li>• Types of fruits and seeds</li> <li>• Tissue differentiation and different types of tissues</li> <li>• Internal origination of primary plant body</li> </ul>

FYBSc- (Paper-II)	Industrial Botany	<ul style="list-style-type: none"> <li>• Introduction, production and advantages of Bio-fuel industries</li> <li>• Study of bio-pesticides, IPM, concept of Biocontrol 3. Biofertilizer concept , types, products and commercial significance</li> <li>• Fruit processing industries, cold storages, types of processing</li> <li>• Study of ayurvedic formulations using specific plants and use of plants as neutraceuticals and pharmaceuticals</li> </ul>
F. Y. B. Sc. (Paper-III)	Practical based on theory paper I& II	<ul style="list-style-type: none"> <li>• Study of anatomy and morphology of different plants</li> <li>• Study of artificial plant propagation techniques</li> <li>• Study of techniques in plant tissue culture</li> <li>• Cultivation of mushrooms</li> <li>• Study of biofertilizers and biopesticides</li> <li>• Preparation of jams, squash, etc.</li> </ul>
S. Y. B. Sc. (Paper-I)	Taxonomy of Angiosperms	<ul style="list-style-type: none"> <li>• Know principals of taxonomy, methods in taxonomy</li> <li>• Types of taxonomy, Sources of data for taxonomy</li> <li>• Methods of preparation of Herbarium, E-Herbarium etc.</li> </ul>
S. Y. B. Sc. (Paper-II)	Plant Physiology	<ul style="list-style-type: none"> <li>• Applications of plant physiology, Mechanism of Absorption of water, Transpiration</li> <li>• Plant growth and growth regulators, Nitrogen Metabolism in plants</li> <li>• Physiology of flowering</li> </ul>
S. Y. B. Sc. (Paper-I)	Plant Anatomy and Embryology	<ul style="list-style-type: none"> <li>• Know different tissue systems in plants</li> <li>• Normal secondary growth and different types of anomalous secondary growth</li> <li>• Study of male and female gametes in angiosperms, Process of fertilization and types of endosperms and structure of embryo.</li> </ul>
S. Y. B. Sc. (Paper-II)	Plant Biotechnology	<ul style="list-style-type: none"> <li>• Know various application of biotechnology like Enzyme technology, Fermentation technology</li> <li>• Single Cell Proteins and Environmental biotechnology</li> <li>• Know Basics of Plant Genetic Engineering, Methods of gene transfer in plants and applications of plant genetic engineering in crop improvement</li> <li>• Knowledge about Nanotechnology and its applications in Agriculture</li> </ul>

S.Y.B.Sc. (Paper-III)	Practical based on theory paper I & II	<ul style="list-style-type: none"> <li>• Know practical knowledge of plant family of angiosperms</li> <li>• Study of different ecological groups and methods to study vegetations in forests</li> <li>• Study different parameters of plant physiology like WHC, DPD, Rate of transpiration and Different instruments used in physiology</li> <li>• Study of Different tissue systems and normal and anomalous secondary growth</li> <li>• Study of fermentation techniques, Spirullina cultivation for SCP</li> </ul>
T.Y.B.Sc. (Paper-I)	Cryptogamic Botany	<ul style="list-style-type: none"> <li>• Systematics and Taxonomy</li> <li>• Evolution from Cryptograms to phanerogams</li> <li>• Classification, economic and ecological importance.</li> </ul>
T.Y.B.Sc. (Paper-II)	Cell and Molecular Biology	<ul style="list-style-type: none"> <li>• Cell biology gives the knowledge of Internal organization of the cell</li> <li>• Cellular signaling, transport and trafficking, Cellular Processes.</li> <li>• Molecular biology provides the Gene structure and Function</li> <li>• DNA: Structure, Functions and Damage</li> </ul>
T.Y.B.Sc. (Paper-III)	Genetics and Evolution	<ul style="list-style-type: none"> <li>• Genetics provides knowledge regarding Classical Genetics, Microbial Genetics &amp; Cytogenetics</li> <li>• Plant Breeding</li> <li>• Evolution provides Information about Darwin theory and lamark's theory</li> </ul>
TYBSc (Paper-IV)	Spermatophyta and Palaeobotany	<ul style="list-style-type: none"> <li>• SPERMATOPHYTA gives knowledge of general characters, economic importance and classification of Gymnosperm and Angiosperm.</li> <li>• PALAEOBOTANY provides the information regarding the Fossils.</li> </ul>
T.Y.B.Sc. (Paper-V)	Horticulture and Floriculture	<ul style="list-style-type: none"> <li>• Understand economic importance of plant and plant product.</li> <li>• Know the methods of plant propagation.</li> <li>• Understand the fruit &amp; vegetables production technology, scope &amp; importance of floriculture.</li> <li>• Methods of cultivation of different flowering plants.</li> </ul>

T.Y.B.Sc. (Paper-VI)	Computational Botany	<ul style="list-style-type: none"> <li>• Study the scope &amp; importance of biostatistics.</li> <li>• Know scope and some basic commonly used terms like sampling, data, dispersion, population, central tendency etc.</li> <li>• Knowledge to apply statistical analysis to biological data for testing different hypothesis.</li> </ul>
T.Y.B.Sc. (Paper-I)	Plant Physiology and Biochemistry	<ul style="list-style-type: none"> <li>• Plant physiology and Biochemistry give knowledge regarding the Photosynthesis, Respiration, Translocation of organic solutes</li> <li>• Carbohydrates, Amino acids and proteins, Secondary Metabolites</li> </ul>
T.Y.B.Sc. (Paper-II)	Plant Ecology and Biodiversity	<ul style="list-style-type: none"> <li>• Know the biotic and abiotic components of ecosystem.</li> <li>• Food chain &amp; food web in ecosystem.</li> <li>• Understand diversity among various groups of plant kingdom.</li> <li>• Understand plant community &amp; ecological adaptation in plants.</li> <li>• Scope, importance and management of biodiversity.</li> </ul>
T.Y.B.Sc. (Paper-III)	Plant Pathology	<ul style="list-style-type: none"> <li>• Study scope and importance of plant pathology.</li> <li>• Know disease cycle and disease development,</li> <li>• Effect of plant diseases on economy of crops.</li> <li>• Know the methods of studying plant diseases. They can identify the plant diseases like bacterial, nematode, and fungal, disease forecasting.</li> <li>• Study prevention and control measures of plant diseases.</li> </ul>
T.Y.B.Sc. (Paper-IV)	Medicinal and Economic Botany	<ul style="list-style-type: none"> <li>• Understand scope and importance of pharmacognosy.</li> <li>• Know the cultivation, collection, processing &amp; importance of various herbal drugs and scope of economic botany.</li> <li>• Know the botanical resources like non wood forest products and study the concept of Ayurvedic pharmacy.</li> </ul>

T.Y.B.Sc. (Paper-V)	Plant Biotechnology	<ul style="list-style-type: none"> <li>• Study of Plant tissue culture Technology and Recombinant DNA technology</li> <li>• Understand Role of microbes in agriculture, medicine &amp; industry.</li> <li>• Study the concept of bioinformatics &amp; genomics proteomics. Understand technical germplasm &amp; cryopreservation.</li> </ul>
T.Y.B.Sc. (Paper-VI)	Plant Breeding and Seed technology	<ul style="list-style-type: none"> <li>• Study the scope &amp; importance of plant breeding.</li> <li>• Study the technique of production of new superior crop varieties, heterosis, hybrid vigor etc.</li> <li>• Know the process of hybrid variety, development &amp; their release.</li> <li>• Know about seed germination, processing , production etc.</li> </ul>
T.Y.B.Sc. (Paper-VII)	Practical I	<ul style="list-style-type: none"> <li>• Study of Vegetative and Reproductive structure of Algae, Fungi, Bryophytes and Pteridophytes</li> <li>• Study techniques of cytology, Mitosis, Meiosis, Chromosome morphology</li> <li>• Estimation of DNA and RNA</li> <li>• Estimate Chlorophyll, TLC, Proteins and Amino acids</li> <li>• Study of advanced biotechnological techniques</li> </ul>
T.Y.B.Sc. (Paper-VIII)	Practical II	<ul style="list-style-type: none"> <li>• Study plant families</li> <li>• Study structural heterozygote's, Gene mapping,</li> <li>• Study of Vegetative and Reproductive structure of gymnosperms and Pleobotany</li> </ul>
T.Y.B.Sc. (Paper-IX)	Practical III	<ul style="list-style-type: none"> <li>• Study techniques in Horticulture and floriculture like cutting, Layering, Budding, Grafting</li> <li>• Calculating Mean mode median, methods of graphical presentations</li> <li>• Study different plant diseases like fungal, bacterial, microbial etc.</li> <li>• Study medicinal plants and methods of preparation of extracts and quantitative analysis of alkaloids, tannins etc.</li> </ul>