

<b>BOTANY</b>				
<b>Sr. No.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Course Objective</b>	<b>Expected Outcome</b>
1	BOT 101	Study of cryptogamic botany, Cytology, Molecular Biology Environmental Biology, climate change and plant Biotechnology	<p>This course is designed to acquaint students with lower plants algae, fungi, bryophyte and Pteridophytes</p> <p>to acquaint students with the concept of cell biology and genetics</p> <p>to acquaint students with the concept ecology and its branches and environment, climate change and biodiversity</p> <p>to acquaint students with the concept biotechnology and techniques of plant tissue culture</p>	<ul style="list-style-type: none"> <li>• Know the importance of this lower group of Plants in Nature.</li> <li>• Learn the morphology, structure, reproduction and importance of classification of lower groups.</li> <li>• Shall learn about the structure functions and important plant cell and its components and mechanism, role and importance of fundamental processes of replication and protein synthesis</li> <li>• Understand the various kinds, structure, components, and energy levels of ecosystem.</li> <li>• Shall learn tools, techniques, types and of applicability Plant tissue culture.</li> <li>• Acquainted with the latest technological developments in the field of Biotechnology and plant tissue culture.</li> </ul>
2	BOT 103	Study higher plants, plant morphology, taxonomy physiology, horticulture and	<p>This course is designed to acquaint students with higher plants: Gymnosperms, Dicotyledons and Monocotyledons.</p> <p>To Understand the basics of taxonomy.</p> <p>To understand basic and vital physiology</p>	<ul style="list-style-type: none"> <li>• Shall learn about the life cycle of individuals belonging to Gymnosperms, Dicotyledons and Monocotyledons.</li> <li>• Students will understand the</li> </ul>

		gardening	<p>processes in plant system and their importance.</p> <p>Will learn about value of plants as food and medicine.</p> <p>Able to understand basic concepts of horticulture and gardening.</p>	<p>morphology, structure and functions of various parts of plants.</p> <ul style="list-style-type: none"> <li>• Learn various plant families and their economic importance</li> <li>• Differentiate between basic physiological processes and their importance.</li> <li>• Will understand the physiology of photosynthesis, respiration, transpiration and flowering.</li> <li>• Able to understand use of plant resources for food and medicine.</li> <li>• Able to understand basic concepts of gardening, including types of garden, garden plants, gardening operations, tools.</li> </ul>
3	BOT- 201	Study of Algae, Fungi, lichens, plant pathology, Bryophytes and economic botany	<p>This course is designed to acquaint students with lower plants cryotogams like algae fungi, lichens and bryophyte.</p> <p>to acquaint students with plant pathology and types of plant diseases.</p> <p>to acquaint students with bryophytes with examples and know its economic importance</p> <p>to acquaint students with economically important plants.</p>	<ul style="list-style-type: none"> <li>• Know the habit and habitat of different cryptogams.</li> <li>• Learn the morphology, structure, reproduction of algae and fungi with examples.</li> <li>• Shall learn about pathogens causing diseases to plants. Their symptoms on the plant, life cycle.</li> <li>• Shall realize the applied and economic value of plants in relation with human life.</li> <li>• Shall understand importance of plants as fibres, timber, fuel, medicine importance of plants through various examples.</li> </ul>

				<ul style="list-style-type: none"> <li>• Shall also learn scientific, names, cultivation, chemical constituents and uses of these plants.</li> </ul>
4	BOT - 202	Plant anatomy, plant ecology, plant embryology and plant cell biology	<p>This course is designed to acquaint students to anatomy of the different internal parts of the plant to acquaint student with arrangement and behaviour of cells during growth to acquaint students different ecological parameters to acquaint students with the reproductive system and its organs in plants to acquaint students with various cell organelles</p>	<ul style="list-style-type: none"> <li>• Shall learn about all aspects of meristematic tissues in plants</li> <li>• Shall learn anatomical structure and functions of simple plant tissues.</li> <li>• Shall be able to differentiate between normal and secondary growth in the plants.</li> <li>• Shall be able to differentiate monocots and dicot plant from its internal structure.</li> </ul>
5	BOT -204	Study of Pteridophytes, gymnosperms, Plant morphology and taxonomy and Physiology.	<p>To acquaint students with life cycle of different Pteridophytes  To acquaint students with gymnosperms  To acquaint student with fruit morphology  To acquaint students to the field of taxonomy and study of families</p>	<ul style="list-style-type: none"> <li>• Learn about life histories of selaginella and adiantum.</li> <li>• Learn about heterospory</li> <li>• Learn about process of fossil formation and their importance.</li> <li>• Shall learn the general characters and classification of gymnosperms and life history of pinus</li> </ul>
6	BOT - 205	Study of plant anatomy, biophysics, biochemistry, genetics and applied botany	<p>To acquaint student with internal structure of plant and changes occurring in anatomical structure during the growth  To acquaint student with basic biophysical processes happening at a cellular level in plants  To acquaint with primary and secondary chemicals of plant metabolism and their significance.</p>	<ul style="list-style-type: none"> <li>• Shall learn the structure, types and function of complex plant tissue-xylem and phloem.</li> <li>• Shall learn about epidermal tissue system of plants in detail.</li> <li>• Shall learn about abnormal secondary growth happening in plants with specific examples of achyranthus and miribillis stem and</li> </ul>

			To acquaint student with importance and role of plants in the society.	<p>ficus and carrot root.</p> <ul style="list-style-type: none"> <li>• Shall learn about mechanism of enzyme action</li> <li>• Will be able to understand major classes of organic compound, their synthesis and breakdown in plants.</li> <li>• Will be able to understand the phenomenon of inheritance in plants.</li> <li>• Will learn basic concept and principal of propagation of fruit plant.</li> <li>• Will learn floriculture, nursery management, art of Bonsai, social and agroforestry.</li> </ul>
7	BOT -301	Algae , Fungi, Plant Pathology, Bryophytes	<p>This course is designed</p> <p>To acquaint students with the structure, methods of reproduction and life history of Algae.</p> <p>To acquaint students with the structure, methods of reproduction and life history of Fungi.</p> <p>To acquaint students with some plant diseases.</p> <p>To acquaint students with the bryophytes.</p>	<ul style="list-style-type: none"> <li>• Learn about the structure, methods of reproduction and life history of Algae.</li> <li>• Learn about the occurrence, distribution, structure, methods of reproduction and life history of Fungi.</li> <li>• Study about tools and procedure to recognize symptoms and pathogens in diseased plant.</li> <li>• Study some plant diseases with special reference to the causative agents, symptoms and control measures.</li> <li>• Know about the classification, adaptation, structure, methods of</li> </ul>

				reproduction and life history of Bryophytes.
8	BOT - 302	Systematic Botany, Angiosperms, Embryology and Anatomy	<p>This course is designed</p> <p>To acquaint students with principles of taxonomy, ICBN, herbarium techniques and some important herbaria.</p> <p>To acquaint students with the angiosperms.</p> <p>To acquaint students with the concept and application of Palynology, Embryo development and its types.</p> <p>To acquaint students with the plant anatomy.</p>	<ul style="list-style-type: none"> <li>• Learn about principles of taxonomy and principles and rules of ICBN.</li> <li>• Study about herbarium techniques, plant collection and preparation of herbarium.</li> <li>• Know role of herbaria and botanical garden and some important herbaria in India.</li> <li>• Learn classification of Angiosperms and study of families.</li> <li>• Know about the Structure and development of dicot and monocot.</li> <li>• Study the concept and application of Palynology, Embryo development and its types.</li> <li>• Understand the tissue system and plant anatomy.</li> </ul>
9	BOT - 303	Plant Physiology, Biochemistry, Cell Biology, Genetics	<p>This course is designed</p> <p>To acquaint students with the plant physiology.</p> <p>To acquaint students with the structure and types of Amino acids, Protein, Lipids and Carbohydrates.</p> <p>To acquaint students with the cell biology and cell cycle.</p> <p>To acquaint students with the plant genetics.</p>	<ul style="list-style-type: none"> <li>• Study causes of seed dormancy and the methods of breaking seed dormancy.</li> <li>• Learn about the seed viability and different phases of seed germination and factors affecting on germination.</li> <li>• Understand the definition, mechanism, applications of vernalization.</li> <li>• Learn about the structure, classification, types and significance of Amino acids, Protein, Lipids and</li> </ul>

				<p>Carbohydrates.</p> <ul style="list-style-type: none"> <li>• Understand about the cell cycle and structure and functions of different cell organelles.</li> <li>• Learn about Mendelian principles, gene mapping methods and gene mutations.</li> </ul>
10	BOT - 304	Ecology, Phytogeography, Economic Botany, Biostatistics	<p>This course is designed To acquaint students with the approaches to the study of Ecology. To acquaint students with the phytogeography and endemism. To acquaint students with the economic products and their uses of botany. To acquaint students with the various statistical methods of analysis.</p>	<ul style="list-style-type: none"> <li>• Study about the plant ecology and vegetation development.</li> <li>• Learn about the concepts, types and mechanism of ecological succession.</li> <li>• Learn the different methods of studying plant communities' synecology.</li> <li>• Study about the types of halophytes, ecological adaptations in halophytes.</li> <li>• Learn about the phytogeography, endemism, botanical regions of India and vegetation of Gujarat.</li> <li>• Know remote sensing and GIS for plant analysis.</li> <li>• Brief study about the economic products with special reference to the Botanical name, family, morphology of useful part and the uses.</li> <li>• Study various statistical methods of analysis.</li> </ul>
11	BOT - 305	Plant Tissue Culture	<p>This course is designed To acquaint students with the</p>	<ul style="list-style-type: none"> <li>• Learn about definition, origin and history of plant tissue culture.</li> </ul>

			<p>introduction and laboratory organization.          To acquaint students with the different techniques used in plant tissue culture.          To acquaint students with the various types of cultures.          To acquaint students with the applications of plant tissue culture.</p>	<ul style="list-style-type: none"> <li>• Get the knowledge about laboratory instruments and laboratory organization.</li> <li>• Understand about sterilization techniques and media composition and preparation.</li> <li>• Know the roles of various plant growth regulators (PGRs).</li> <li>• Learn about the inoculation of the explants and maintenance of culture.</li> <li>• Study various types of cultures.</li> <li>• Learn different applications of plant tissue culture.</li> </ul>
12	BOT - 307	Pteridophytes, Pteridophyte fossils, Gymnosperms, Gymnosperm fossils	<p>This course is designed          To acquaint students with the pteridophytes.          To acquaint students with the pteridophytes fossils.          To acquaint students with the gymnosperms.          To acquaint students with the gymnosperm fossils.</p>	<ul style="list-style-type: none"> <li>• Learn about characters, classification, structure, reproduction and life history of Pteridophytes.</li> <li>• Study about the Stellar evolution in Pteridophytes.</li> <li>• Understand about the geological time scale, Psilophytales, Lepidodendrales and Calamitales.</li> <li>• Study classification and economic importance of gymnosperm.</li> <li>• Learn morphology, anatomy, reproduction and life history of Gymnosperms.</li> <li>• Learn about carbon dating, fossil biology and economic importance of Gymnosperms.</li> </ul>

13	BOT - 308	Angiosperms, Plant Anatomy, Advanced Biochemistry, Microbiology	<p>This course is designed</p> <p>To acquaint students with the angiosperms</p> <p>To acquaint students with the plant anatomy.</p> <p>To acquaint students with the advance biochemistry.</p> <p>To acquaint students with the basic concepts of microbiology.</p>	<ul style="list-style-type: none"> <li>• Understand classification and economic importance – Dicotyledons and Monocotyledons.</li> <li>• Learn about different methods for collection fixation, presentation and microtomy.</li> <li>• Study about the glycolysis and krebs cycle of carbohydrate metabolism.</li> <li>• Learn about amino acid pool, deaminaton, transamination of protein metabolism.</li> <li>• Study about the glycerol metabolism, alpha and beta oxidation of fatty acids.</li> <li>• Get the information of various vitamins.</li> <li>• Know the properties of viruses and structure of bacteria and bacteriophage.</li> <li>• Understand about the industrial application of bacteria.</li> </ul>
14	BOT - 309	Advanced Plant Physiology, Plant Breeding, Molecular Biology, Biotechnology	<p>This course is designed</p> <p>To acquaint students with the advance plant physiology.</p> <p>To acquaint students with the plant breeding.</p> <p>To acquaint students with the basic concepts of molecular biology.</p> <p>To acquaint students with the basic concept of biotechnology.</p>	<ul style="list-style-type: none"> <li>• Learn plant movement, plant growth, growth regulators and senescence.</li> <li>• Understand the aims, objectives and impacts of plant breeding.</li> <li>• Get idea about procedure of plant introduction and selection methods.</li> <li>• Study about different techniques of</li> </ul>

				hybridization. <ul style="list-style-type: none"> <li>• Know about general account and techniques of gene mapping, DNS sequencing and DNA fingerprinting.</li> <li>• Learn about Application of Biotechnology in health and agriculture.</li> <li>• Study about various methods of gene transfer in plants.</li> </ul>
15	BOT - 310	Environmental Biology , Gardening, Ethnobotany, Forestry	This course is designed To acquaint students with the brief idea about the environmental biology. To acquaint students with the basic principles of gardening. To acquaint students with the basic concepts of the ethnobotany. To acquaint students with the forest, wildlife and biosphere reserves.	<ul style="list-style-type: none"> <li>• Learn about Environmental Impact Assessment (EIA), greenhouse gases.</li> <li>• Study about the Climate change and its Consequences.</li> <li>• Learn about the effects of Air, Water and Soil pollution on vegetation.</li> <li>• Understand the principles of garden design, garden features and different operations.</li> <li>• Study about the History and development of Ethnobotany.</li> <li>• Learn about various methods of Ethnobotanical research.</li> <li>• Know about the benefits of forests and its products and forest types of India.</li> <li>• Study about the wildlife and biosphere reserves.</li> </ul>
16	BOT - 311	Horticulture and	This course is designed	<ul style="list-style-type: none"> <li>• Learn about the definition, branches,</li> </ul>

		Gardening	<p>To acquaint students with the basic fundamentals of horticulture.</p> <p>To acquaint students with the soil, water and fertilizers.</p> <p>To acquaint students with the plant propagation and plant protection.</p> <p>To acquaint students with the special horticulture practices.</p>	<p>importance and scope of horticulture.</p> <ul style="list-style-type: none"> <li>● Study about the classification of horticultural crops and garden tools and equipments.</li> <li>● Understand the physical texture and composition of the soil and soil types.</li> <li>● Know about the application of fertilizers, biofertilizers and organic fertilizers.</li> <li>● Study about the vegetative propagation methods and various method of sowing seeds.</li> <li>● Learn about greenhouse cultivation, floriculture, terrariums and organic gardening.</li> </ul>
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