

**GOVERNMENT DEGREE COLLEGE, BARUVA**

**DEPARTMENT OF BOTANY**

**Expected Learning outcomes from the Course B.Sc, Botany**

<b>Course Code</b>	<b>Course Name</b>	<b>Objectives</b>	<b>Learning outcomes</b>
<b>Semester-I: Paper-I</b>	<b>Title: Diversity of microbes, viruses, Bacteria, Algae and Fungi</b>	<ul style="list-style-type: none"> <li>➤ To acquire knowledge about basic definitions, facts and concepts of microbial diversity along with the useful and harmful aspects of microbes.</li> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Thallophytes along with the useful and harmful aspects of Algae and Fungi.</li> <li>➤ To impart laboratory observation skills.</li> <li>➤ To develop scientific attitude, laboratory discipline and interest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Understand the diversity within the microbial world.</li> <li>➤ Know the structure of viruses and differentiate the Viroids and Prions.</li> <li>➤ Understand the diseases of plants and animals caused by viruses.</li> <li>➤ Appreciate the use of microbes in food, agriculture and Industry.</li> <li>➤ Understand the diversity of algae in structure, pigments and alternation of generations.</li> <li>➤ Understand the classification of fungi their economic importance.</li> <li>➤ Understand the basic principles of Plant Pathology and certain plant diseases</li> </ul>
<b>Semester-II: Paper-II</b>	<b>Title: Gymnosperms, plant anatomy</b>	<ul style="list-style-type: none"> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Archegoniate diversity along with the life cycles of specific individuals.</li> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Plant anatomy by understanding the internal morphology of plants .</li> <li>➤ To impart laboratory observation skills.</li> <li>➤ To develop scientific attitude, laboratory discipline and interest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Understand the diversity and classification of Bryophytes, Pteridophytes and Gymnosperms.</li> <li>➤ Understand the sporophyte evolution in Bryophytes.</li> <li>➤ Comprehend the knowledge on heterospory and how it leads to evolution of seed habit in Pteridophytes.</li> <li>➤ Know the evolution of stele in Pteridophytes.</li> <li>➤ Understand the economic importance of Gymnosperms.</li> <li>➤ Know the plant tissues, like simple and complex which they form the complete plant body.</li> <li>➤ Identification and differentiation of meristematic and permanent tissues in plants.</li> <li>➤ Understand the role of secondary growth in wood formation and differentiate the</li> </ul>

			<p>anomalous secondary growth in plants.</p> <ul style="list-style-type: none"> <li>➤ Understand the economic importance of Teak wood, Rosewood and Red sanders.</li> </ul>
<b>Semester-III: Paper-III</b>	<b>Title: Plant Taxonomy and Embryology</b>	<ul style="list-style-type: none"> <li>➤ To acquire knowledge about basic definitions, facts and concepts of classification systems of Angiosperms and Angiospermic families along with the useful and harmful aspects of plants of prescribed Angiospermic families.</li> <li>➤ To acquire knowledge about basic definitions, facts and concepts and mechanisms of biological processes of plant embryo formation and development</li> <li>➤ To impart laboratory observation skills specifically related to the observation of floral characters useful in plant identification.</li> <li>➤ To develop scientific attitude, laboratory discipline and interest</li> </ul>	<ul style="list-style-type: none"> <li>➤ Understand the basic principles in Taxonomy-Description, Identification, Nomenclature and Classification.</li> <li>➤ Know the use of taxonomic resources like Herbarium, Flora and Keys for identification of plant species.</li> <li>➤ Learn the techniques of preparing the herbarium and its usage.</li> <li>➤ Differentiate the natural, artificial and phylogenetic classification systems.</li> <li>➤ Understand the Key/ diagnostic features of taxonomic families and applied the knowledge in ascertain the plants to the respective families.</li> <li>➤ Know the reproductive events from the development of reproductive cells (Gametes), pollination, fertilization, embryogeny and seed development in flowering plants.</li> <li>➤ Appreciate the adaptations for pollination, especially for encouraging cross-pollination in flowering plants.</li> <li>➤ Comprehend the knowledge on pollen-pistil interaction and incompatibility in flowering plants.</li> </ul>
<b>Semester-IV: Paper-IV</b>	<b>Title: Plant physiology and Metabolism</b>	<ul style="list-style-type: none"> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Plant physiology.</li> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Plant metabolism and biochemical processes related to plant internal biochemical reactions.</li> <li>➤ To impart laboratory observation skills related important processes</li> </ul>	<ul style="list-style-type: none"> <li>➤ Know the basic aspects of plant physiology like photosynthesis, respiration and Mineral nutrition.</li> <li>➤ Understand the importance of plant water relations for the growth and development of plants</li> <li>➤ Comprehend the relation of water status-Stomatal movements – Transpiration.</li> <li>➤ Know the role of macro and micro nutrients for the growth and development of plants.</li> </ul>

		<p>related to the life of plants.</p> <ul style="list-style-type: none"> <li>➤ To develop scientific attitude, laboratory discipline and interest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Appreciate the role of some microbes like Rhizobium in Biological Nitrogen fixation.</li> <li>➤ Appreciate the diversity of plants like C<sub>3</sub> C<sub>4</sub> and CAM plants with respect to their carbon reduction pathways.</li> <li>➤ Understand the role of plant hormones in plant growth development.</li> <li>➤ Know the importance of Physical factors like light and temperatures in switching of plants from vegetative to reproductive stage.</li> <li>➤ Know the morphological and physiological changes associated with senescence of plants and plant parts.</li> </ul>
<b>Semester-V: Paper-V</b>	<b>Title : Cell Biology, Genetics and Plant Breeding</b>	<ul style="list-style-type: none"> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Plant cell biology mainly related to cell ultra structures.</li> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Genetics along with the process of inheritance of specific traits.</li> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Plant breeding by knowing the processes of plant breeding methods</li> <li>➤ To impart laboratory observation skills related to important processes related to the life of plants.</li> <li>➤ To develop scientific attitude, laboratory discipline and interest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Knowing about the cell theory and typical eukaryotic and prokaryotic cells.</li> <li>➤ Identifying the differences between plant and animal cells through microscopic observations</li> <li>➤ Understanding the basic concepts of genetic material and it's physical and biochemical natures along with the replication of the genetic material</li> <li>➤ Understanding the basic concepts of inheritance of the characters from generation to generations and knowing the main basis for this.</li> <li>➤ Studying the significance and basis of recombination in inheritance</li> <li>➤ Getting the skills of constructing a genetic map from the frequencies of recombination and applying the concept of Linkage of genes.</li> <li>➤ Knowing the basic principles and methods of Plant breeding and their applications in the improvement of crops</li> </ul>
<b>Semester-VI: Paper-VI</b>	<b>Title: Plant Ecology &amp; Phytogeography</b>	<ul style="list-style-type: none"> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Ecology mainly related to different types of ecosystems.</li> <li>➤ To acquire knowledge about basic</li> </ul>	<ul style="list-style-type: none"> <li>➤ Understanding the basic principles of the ecosystem structure and functions in relation to its dynamics</li> <li>➤ Observation of different types of ecosystem to appreciate the organization and operations</li> </ul>

		<p>definitions, facts and concepts of Phytogeography.</p> <ul style="list-style-type: none"> <li>➤ To acquire knowledge about basic definitions, facts and concepts of biodiversity of plants.</li> <li>➤ To impart laboratory observation skills.</li> <li>➤ To develop scientific attitude, laboratory discipline and interest.</li> </ul>	<p>responsible for the ecological balance</p> <ul style="list-style-type: none"> <li>➤ Knowing the facts about the ecological factors like light, soil, temperature etc.</li> <li>➤ Identifying the productivity of the ecosystem by understanding the concepts of energy production and its flow in the ecosystem.</li> <li>➤ Understanding the centers of distribution of plants by getting knowledge of basics in phytogeography.</li> <li>➤ Understanding the basics of Biodiversity, its importance, threats and methods of conservation.</li> </ul>
<b>Semester-VI: Paper-VIII A1</b>	<b>Title: Plants Diversity and human welfare</b>	<ul style="list-style-type: none"> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Plant Diversity With Reference to the relation between plants and human beings.</li> <li>➤ To acquire knowledge about basic definitions, facts and concepts of biodiversity management-methodology.</li> <li>➤ To develop scientific attitude, laboratory discipline and interest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Understanding the relation between plants and human beings.</li> <li>➤ Understanding Genetic diversity, Species diversity, Plant diversity at the ecosystem Agro biodiversity and cultivated plant taxa, wild taxa.</li> <li>➤ Knowing about the Management of plant biodiversity: Organizations associated with biodiversity management-methodology for execution.</li> <li>➤ Appreciating the Environmental Impact Assessment (EIA), Geographical Information</li> </ul>

			<p>System GIS.</p> <ul style="list-style-type: none"> <li>➤ Getting awareness on Conservation of genetic diversity, species diversity</li> <li>➤ Appreciating the Importance of forestry, their utilization and commercial aspects</li> </ul>
<b>Semester-VI: Paper-VIII A2</b>	<b>Title: Ethnobotany and Medicinal Botany</b>	<ul style="list-style-type: none"> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Ethnobotany.</li> <li>➤ To acquire knowledge about basic definitions, facts and concepts of Indigenous Medicinal Sciences.</li> <li>➤ To impart laboratory observation skills related to Ethnobotany and Indigenous Medicinal Sciences techniques.</li> <li>➤ To develop scientific attitude, laboratory discipline and interest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Understanding Ethnobotany as an interdisciplinary science and the relevance of ethnobotany in the present context.</li> <li>➤ Appreciating the role of ethnobotany in modern medicine with special example.</li> <li>➤ Understanding the role of ethnic groups in the conservation of plant genetic resources.</li> <li>➤ Getting knowledge about Biopiracy, Intellectual Property Rights and protection of traditional Knowledge.</li> <li>➤ Knowing about the History, Scope and Importance of Indigenous Medicinal Sciences like Ayurveda, Sidda and Yunani.</li> <li>➤ Understanding the Conservation strategies of endangered and endemic medicinal plants</li> </ul>
<b>Semester-VI: Paper-VIII A3</b>	<b>Title: Pharmacognosy and Phytochemistry</b>	<ul style="list-style-type: none"> <li>➤ To acquire knowledge about basic definitions, facts and concepts of pharmacognosy.</li> <li>➤ To acquire knowledge about basic definitions, facts and concepts of secondary metabolites.</li> <li>➤ To impart laboratory observation skills related microscopic evaluation for the identification of crude drugs.</li> <li>➤ To develop scientific attitude, laboratory discipline and interest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Understand the importance and role of pharmacognosy in determining the purity of crude drugs.</li> <li>➤ Know the methods of organoleptic and microscopic evaluation for the identification of crude drugs.</li> <li>➤ Knowing the secondary metabolite biosynthetic pathways.</li> <li>➤ Understand the methods for testing the secondary metabolites like alkaloids, phenols, flavonoids, tannins and sterols and applied the learnt knowledge in phytochemistry.</li> <li>➤ Known the use of enzymes, proteins and aminoacids as drugs.</li> </ul>