

Faculty: Science

Department: Botany

Paper No.	Objectives	Programme outcomes	Programme Specific outcomes	Course outcomes
Paper-I: Viruses, Bacteria, Algae, Fungi, Lichens and Mycorrhiza	<ol style="list-style-type: none"> To study and impart knowledge about the occurrence, distribution, structure and life history of lower plants such as algae, fungi, lichens To instill in students an appreciation for the diversity of plant forms and structural organization that exists within plant bodies that allow plants to develop and live as integrated organisms in diverse environments 	Students will learn the structure and life cycle of algae, fungi, lichens.	<ol style="list-style-type: none"> Students can identify different plants, algae, fungi, bacteria, viruses, lichens and mycorrhiza and their uses. Able to understand the ecological principles, interactions taking place in the Ecosystems and the flow of energy Learn about process of fossil formation and fossils plants Understand the methods of collecting and preserving plants. 	<ol style="list-style-type: none"> Understand the morphology, structure and importance of the various organisms Differentiate between various groups of Algae, Fungi, Bacteria, Viruses, and Lichens & Mycorrhiza Learn the life cycles of individuals belonging to Algae, Fungi, Bacteria, Viruses, Lichens & Mycorrhiza. Learn biological importance of Viruses, Bacteria, Algae, Fungi, Lichens and Mycorrhiza.
Paper-II: Plant Ecology, Phytogeography and Environmental Biology	<ol style="list-style-type: none"> Acquainted with basic concepts of Ecology, Ecosystem Ecological factors, community ecology and phytogeography To provide students with skills necessary for Ecological studies 	The students will be able to understand basic concepts of Ecology.	<ol style="list-style-type: none"> Create platform for higher studies in Botany. Facilitate students to take-up successful career in Botany. Inculcate strong fundamentals on modern and classical aspects of Botany. 	<ol style="list-style-type: none"> Able to understand the ecological principles, interactions taking place in the Ecosystems and the flow of energy Learn about the concept of phytogeography and its relations with other disciplines.
Paper-III: Bryophytes, Pteridophytes, Gymnosperms & Paleobotany	<ol style="list-style-type: none"> To study the occurrence, distribution, structure and life history of bryophytes, pteridophytes and gymnosperms To provide students with skills in paleobotany studies 	Students shall learn the structure and life cycle of bryophytes, Pteridophytes, gymnosperms and paleobotany	<ol style="list-style-type: none"> Educate students in and around Bhokar, about plant science. Opportunities in research in plant sciences. Job opportunities in teaching at institutes as well as in universities and in agricultural industries. 	<ol style="list-style-type: none"> Learn the life cycles of individuals belonging to Bryophytes, Pteridophytes and Gymnosperms. Learn the geological time scale and history of plant fossils. Learn about process of fossil formation and fossils plants Learn about the economic, biological importance of bryophytes, pteridophytes &

				<u>gymnosperms</u>
Paper-IV: Taxonomy of Angiosperms	<ol style="list-style-type: none"> To study the types of classifications- artificial, Natural and phylogenetic To study the principles and rules of ICN and taxonomical terminology To study the various plant families and their economic importance 	The students will be able to understand the taxonomical terminology, classification and different families		<ol style="list-style-type: none"> Proficiency with the basic terminology of plant morphology Able to identify the major families of plants and their economic importance Understand the methods of collecting and preserving plants
Paper-VI: Plant Anatomy	<ol style="list-style-type: none"> To know about the internal structure of the most evolved group of plants, the Angiosperm. To study cells, tissues, meristem, epidermal and vascular tissue system in plants. To acquire knowledge of tissue systems, histology and growth pattern in plants. 	<ol style="list-style-type: none"> The students will be able to understand the meristem (RAM & SAM) different simple and complex tissues and secondary growth in root and stem. Students will acquire knowledge of anatomy of root, stem and leaf in dicot and monocot plants. 		<ol style="list-style-type: none"> Able to differentiate the monocot and dicot anatomy. Able to identify and differentiate the tissues and their role.
Paper-VII: Plant Physiology and Biochemistry	<ol style="list-style-type: none"> To make students realize how plants function, namely the importance of water, minerals, hormones, and light in plant growth and development; understand transport mechanisms and translocation in the phloem, applications of plant physiology. To acquaint the students with the types and their functions of different biomolecules and secondary metabolites To know the role of 	<ol style="list-style-type: none"> Students will gain the knowledge of water and nutrient uptake, movement in plants, role of mineral elements, translocation of sugars, Role of various plant growth regulators, phytochrome in plants. Students shall learn different types of biomolecules and secondary metabolites 		<ol style="list-style-type: none"> Able to understand the biophysico-chemical phenomenon in plants. Learn about the mineral nutrition in plants. Able to understand the role of plant growth regulators. Learn the structure of biomolecules and biological functions of Secondary metabolites.

	different plant growth regulators in plant physiology.	3. Students will learn the flowering physiology, vernalization and seed dormancy in plants.		
Paper-VIII: Plant Embryology	1.To study the flowering and fruiting, reproduction process, role of pollinators, ovule fertilization, Endosperm and seed development in angiosperms.	1. This course will be able to demonstrate foundational knowledge in embryology of plants. 2. Students will be able to understand the development of pollen, Ovule, and fertilization and palynological information		1. Learn the detail structure of pollen grain, endosperm, embryo and ovule. 2. Learn the formation of embryo and seed.
Paper-IX: Plant Metabolism and Biotechnology	1. To study of different pathways in Photosynthesis, respiration , nitrogen metabolism 2. To gain the knowledge of basic aspects and applications of plant tissue culture 3. To study the different aspects of genetic engineering and bioinformatics	1. Students will be able to understand the various metabolic processes such as photosynthesis, respiration, Nitrogen metabolism etc. which are important for life. 2. Students shall be become familiar with the gene cloning and its transfer in plants 3. Students shall learn different databases and their applications		1. Learn the different pathways in plants. 2. Learn the basic aspects and mechanism of enzyme. 3. Learn the techniques in plant tissue culture and r-DNA technology. 4. Learn the different biological database tools in Bioinformatics.
Paper-XII : Cell and Molecular biology	1. To know about the ultra structure of a cell, cell wall, cell membrane, cell organelles and chromosomes, cell cycle and cell division.	1. The students will be able to understand ultra structure of a cell, cell wall, cell membrane, cell organelles and		1. Learn the cell organelles, structure and functions of prokaryotic cell and eukaryote cell. 2. Learn the structure of typical chromosome, giant chromosome

	<p>2. To study in detail the structure of DNA and RNA, protein synthesis, gene structure, gene mutation and related diseases.</p> <p>3. To acquire knowledge of cell and molecular biology</p>	<p>chromosomes, cell cycle and cell division.</p> <p>2. The students will be able to understand in detail the structure of DNA and RNA, protein synthesis, gene structure, gene mutation and related diseases.</p> <p>3. Students will acquire knowledge of cell and molecular biology</p>		<p>and cell cycle.</p> <p>3. Learn the structure, composition and functions of DNA.</p> <p>4. Learn the structure of gene, regulation of gene and different genetic diseases.</p>
<p>Paper-XIII: Plant Pathology-I</p>	<p>1. To know about the fundamentals of plant pathology.</p> <p>2. To study in detail the process of plant disease development.</p> <p>3. To acquire knowledge of different plant diseases in different plants.</p>	<p>1. The students will be able to understand fundamentals of plant pathology.</p> <p>2. The students will be able to understand in detail the process of plant disease development.</p> <p>3. Students will acquire knowledge of different plant diseases in different plants.</p>		<p>1. Learns basic knowledge of plant pathology</p> <p>2. Able to identification of diseases on crop plant.</p> <p>3. Learn the mechanism of infection.</p> <p>4. Control measures on various plant diseases.</p> <p>5. Able to isolation & identification of different plant pathogen.</p> <p>6. Able to disease forecasting for the different areas.</p> <p>7. Understand the importance of seed borne pathogens & Certification.</p> <p>8. Learn the life cycle of causal organisms</p>
<p>Paper-XIV: Genetics and Plant Breeding</p>	<p>1. To study Mendelian genetics, gene interaction.</p> <p>2. To study sex determination, linkage, sex linked inheritance and genetic variations.</p> <p>3. To study various crop</p>	<p>1. Understand Mendelian genetics, gene interaction.</p> <p>2. Learn the sex determination, linkage, sex linked inheritance and genetic</p>		<p>1. Learn the Mendelian genetics, gene interaction and sex determination.</p> <p>2. Learn the linkage, Sex linked inheritance, Genetic variations and syndromes.</p> <p>3. Learn the methods in plant breeding, hybridization and</p>

	improvement methods in plant breeding.	variations. 3. Understand various crop improvement methods in plant breeding.		heterosis. 4. Learn the advantages and disadvantage of plant breeding, 5. Learn the mutational breeding and male sterility.
Paper –XV: Plant Pathology-II	1. To know about the fundamentals of aerobiology and seed pathology. 2. To study in detail the process of plant Defense mechanism and management. 3. To acquire knowledge of different plant diseases in different plants.	1. The students will be able to understand fundamentals of aerobiology and seed pathology. 2. The students will be able to understand in detail the process of plant Defense mechanism and management. 3. Students will acquire knowledge of different plant diseases in different plants.		1. Learns basic knowledge of plant pathology 2. Able to identification of diseases on crop plant. 3. Learn the mechanism of infection. 4. Control measures on various plant diseases. 5. Able to isolation & identification of different plant pathogen. 6. Able to disease forecasting for the different areas. 7. Understand the importance of seed borne pathogens & Certification.

1. Importance and scope of the discipline and to provide mobility to students from one university or state to other.
2. To enable the students to face NET, SET, UPSC and other competitive examinations successfully.
3. To impart knowledge of plant science as the basic objective of Education.
4. To develop a scientific attitude to make students open minded, critical and curious.
5. To develop an ability to work on their own and to make them fit for the society.
6. To expose themselves to the diversity amongst life forms.
7. To develop skill in practical work, experiments, equipments and laboratory use along with collection and interpretation of plant materials and data.
8. To make aware of natural resources and environment and the importance of conserving the same.
9. To develop ability for the application of the acquired knowledge in the fields of life so as to make our country self reliant and self sufficient.
10. To appreciate and apply ethical principles to plant science research and studies.