



Shri Shivaji Education Society Amravati's

**Science College,**  
**Congress Nagar, Nagpur**  
**DEPARTMENT OF BOTANY**



**COURSE OUTCOMES OF B.Sc. BOTANY**

B.Sc. Botany is a 6-semester course conducted by S.S.E.A's, Science College, Congress Nagar, Nagpur as per the syllabus provided by Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur. Each semester students have to take two theory papers, and practical based on it. Coursework is according to theory papers, practical, and related assignments such as field tour, field observation, unit test, class seminars, and different activities of botanical society conducted throughout the program. **Course Outcomes (COs): As per Syllabus (BOS, Botany):-**

**COURSE OUTCOMES OF B.Sc. BOTANY 2024-2025 (NEP)**

**B.Sc.Semester-I : (DSC-I)-BOTANY Paper-I (BBO1T01) Microorganisms-Viruses, Prokaryotes, Algae and Fungi.**

**COURSE OUTCOME**

**CO1:** The course, will enable students to know about different types of microorganisms: virus, bacteria, Cyanobacteria, mycoplasma and fungi.

**CO2:** Students will develop a comprehensive understanding of the diversity among microorganisms, including viruses, prokaryotes (bacteria and archaea), algae, and fungi.

**CO3:** Awareness of the role of viruses in disease, biotechnology, and genetic engineering.

**CO4:** Students will explore various types of bacterial reproduction (binary fission, conjugation, transformation, transduction).

**CO5:** Students will explore the structure, classification, and reproduction of fungi.

**CO6:** Students will gain knowledge about the interactions between microorganisms and their environments, including symbiotic relationships

## (DSC-II)-BOTANY Paper-II(BBO1T02) Paleobotany, Bryophyta and Pteridophyta.

### **COURSE OUTCOME**

- CO1:** Gain knowledge of the origin and evolution of plants through fossil records.
- CO2:** Learn the significance of fossil plants in reconstructing ancient ecosystems and climates.
- CO3:** Develop the ability to identify and interpret plant fossils and their role in evolution.
- CO4:** Study the life cycle, classification, and ecological roles of **bryophytes** (mosses, liverworts, and hornworts).
- CO5:** Understand their role as pioneer species in colonizing new environments.
- CO6:** Learn about the morphology, anatomy, and reproductive strategies of **pteridophytes**
- CO7:** Develop skills in identifying fossils, bryophytes, and pteridophytes through fieldwork and lab analysis.
- CO8:** Gain hands-on experience in studying plant morphology, anatomy, and reproduction using microscopes and fossil analysis tools.
- CO9:** Apply knowledge from paleobotany to understand current climate changes through historical plant data.
- CO10:** Explore the ecological applications of bryophytes and pteridophytes in bio-monitoring, conservation, and habitat restoration efforts.

## VSC Botany (BVS1P01) : Identification of Higher plants.

### **COURSE OUTCOME**

- CO1:** Gain knowledge of the taxonomy and classification systems used to identify higher plants (angiosperms and gymnosperms), including families, genera, and species.
- CO2:** Develop skills to identify plants based on their external features, such as leaves, flowers, stems, roots, fruits, and seeds.
- CO3:** Enhance the ability to conduct field-based plant identification, using dichotomous keys, field guides, and herbarium specimens.
- CO4:** Acquire skills in collecting, preserving, and documenting
- CO5:** plant specimens in a herbarium for future reference and study.

## SEC Botany (BVS1P02) : Soil Analysis and Hydrobiology

### **COURSE OUTCOME**

- CO1:** Developed a comprehensive understanding of both soil and aquatic systems.
- CO2:** Gain insight into the physical, chemical, and biological properties of soils, including their formation, composition, and the methods used to analyze and interpret these properties for various applications.

**CO3:** Explore the structure and function of aquatic ecosystems, assessing water quality through the examination of parameters such as pH, dissolved oxygen, and nutrient levels.

**CO4:** Understanding the importance of sustainable practices in managing soil and water resources to protect and preserve ecosystems.

**CO5:** Develop the technical skills necessary to perform a variety of soil and water tests.

### GE/OE-I BOTANY (BGO1T01)

#### **COURSE OUTCOME :**

**CO1:** Gain insight into the types of biofertilizers (e.g., nitrogen-fixing bacteria, mycorrhizal fungi) and their role in enhancing soil fertility and plant growth.

**CO2:** Explore how biopesticides contribute to sustainable agriculture by targeting pests without harming beneficial organisms or the environment.

**CO3:** Understand the process of composting organic waste, including the roles of microorganisms in decomposition.

**CO4:** Integrate biopesticides into integrated pest management (IPM) plans, considering factors such as pest biology, crop type, and environmental conditions.

**CO5:** Methods of improve process of composting

**CO6:** Students will gain knowledge about the commercial production of biofertilizers.

### GE/OE-II BOTANY (BGO1T02)

#### **COURSE OUTCOME:**

**CO1:** Recognize and identify a variety of indoor and outdoor plants.

**CO2:** Comprehend the types of soils suitable for indoor and outdoor gardening.

**CO3:** Understand the fundamentals of landscape design, including spatial arrangement, color theory, and the integration of plants and structures..

**CO4:** Develop and execute a comprehensive plan for a landscaping project or indoor garden, from concept to completion.

**CO5:** Computer application in landscaping.

**CO6:** Utilize tools and technology for designing and managing garden spaces.

## COURSE OUTCOMES OF B.Sc. BOTANY (2021-2022 ONWARDS)

### SEMESTER-I

#### **Paper – I: Viruses, Prokaryotes, Algae and Biofertilizers**

Course outcome: *Students will be able to*

CO1: Identify various microbial life forms in depth with ultrastructure, reproduction and economic importance.

Co2: To gain knowledge about cyanobacteria with ultrastructure and economic importance and algae: classification and economic importance.

Co3: To understand complete life history of *chara*, *vaucheria*, *Ectopus* and *batrachospermum*.

Co4: To acquire skill development practices in the field of biofertilizers. Commercial production of *rhizobium*, *psb*, *azotobacter* and *azolla*.

#### **Paper – II: (Fungi, Plant Pathology, Lichens, Bryophyta and Mushroom Cultivation)**

Course outcome: *Students will Remember and understand*

CO1: The General characteristics, Classification & economic importance of Fungi. Study in detail the life history of *Albugo*, *Mucor*, *Puccinia*, *Cercospora*

CO2: To explore host, pathogen, symptoms, Causes and Control of Leaf curl of Papaya, Citrus canker and Red rot of Sugarcane. To understand the types and reproduction in Lichens.

CO3: The General characteristics, Classification & economic importance of Bryophytes. Study in detail the life history of *Marchantia*, *Anthoceros*, *Funaria*

CO4: To acquire Skill development practices in the field of mushroom cultivation

**Practical CO:-** The course focuses on viruses, prokaryotes, algae, fungi, plant pathology, lichens, bryophyta and biopreneurship through biofertilizers and mushroom cultivation.

### SEMESTER-II

#### **Paper-I: (Palaeobotany, Pteridophytes, Gymnosperms and Soil analysis)**

Course outcome: *Students will gain the skills to identify and evaluate critical information of*

CO1: Palaeobotany, types of fossils, and geological time scale

CO2: Pteridophytes, classification, life history, heterospory, seed habit, and steles.

CO3: General characteristics, classification, life cycle of gymnospermic forms.

CO4: Soil analysis: properties, types, and method of collection of soil samples.

### **Paper – II: (Morphology of Angiosperms and Floriculture)**

Course outcome: *After completion of this course students will gain knowledge of -*

CO1: Vegetative morphology of angiospermic plant parts.

CO2: Reproductive morphology, evolutionary significance, identification and description of floral characters of angiosperms.

CO3: To get an insight on taxonomic terminologies and description of carpel and types of fruit.

CO4: Skill development practices in floriculture related to cultivation, irrigation and harvesting.

**Practical CO:-** The course focuses on morphology, anatomy, reproduction and evolution in pteridophytes, gymnosperms, and angiosperms including biopreneurship through floriculture and soil analysis.

## **SEMESTER-III**

### **Paper-I: (Angiosperm Systematics, Embryology and Indoor Gardening)**

Course outcome: *Students will be able to understand*

CO1: Origin of angiosperms, fossils angiosperms, plants diversity, description, identification, nomenclature and their classification including modern trends in the plant systematics.

CO2: Systems of classification and study of Angiosperm families

CO3: Embryology, pollination, and Fertilization in plants development.

CO4: Various analytical and technical skills related to Skill landscaping and Indoor gardening

### **Paper – II: (Angiosperm Anatomy and Horticulture)**

*Course outcome: This course aims to add to understanding of the students about the*

CO1: Tissue, apical meristem of root and shoot: structure and functions.

CO2: Types of vascular bundles, normal primary structure of root, stem, and normal, anomalous secondary growth.

CO3: Periderm, growth rings, Sap-heartwood, leaf anatomy.

CO4: Skill development practices in horticulture: methods of propagation of horticultural crops and bonsai preparation.

**Practical-CO:** The students become competent enough to develop knowledge about the systematics, embryology, anatomy and through skill based biopreneurship horticulture and indoor gardening practices.

## **SEMESTER-IV**

### **Paper-I: (Cell Biology, Plant Breeding, Evolution and Seed Technology)**

*Course outcome: After successful completion of this course, students will be able to understand*

CO1: Concept of Cell biology, cell organization, Structure and functions

CO2: Basic of Chromosome morphology, molecular organization and cell division:

CO3: Biostatistics, fundamental techniques in plant breeding and evolutionary significance .

CO4: Skill development practices in seed technology.

### **Paper – II: (Genetics, Molecular Biology and Plant Nursery)**

*Course outcome Students will be able to conceive the idea of*

CO1: Mendelism, interaction of genes, linkages and crossing over.

CO2: Mutation, chromosomal aberrations, DNA damage and repair.

CO3: Concept of gene, regulation, protein synthesis and genetic code.

CO4: Skill Development practices in plant nursery planning and management:

**Practicals CO:** Students learn to carry out practical work on cell division, genetics, molecular Biology in the laboratory and skill based biopreneurship through seed technology and plant nursery practices.

## **SEMESTER-V**

### **Paper-I: (Plant Physiology, Mineral Nutrition and Hydroponics)**

Course outcome: *Students will be able to improve the basic understanding on various physiological life processes in plants,*

CO1: To gain knowledge about the various uptakes and transport mechanisms in plants and are able to coordinate the various processes. They understand the role of Plant-Water relation, Transpiration, Mineral uptake.

CO2: Enrich themselves with the phenomenon mechanism of Photosynthesis and Respiration: and their role in plants.

CO3: Understand the process of N- Fixation, Plant Movements, Photoperiodism, Nitrogen Metabolism, and Plant Movements.

CO4: Skill Development practices like Mineral nutrition and Hydroponics.

### **Paper – II: (Plant Ecology and Organic Farming)**

Course outcome: *Students will remember and understand*

CO1: The basics and principles of ecology, biological diversity, conservation, sustainable development, population, community, climatic factors and edaphic factors.

CO2: The concept, types, development and functions of various ecosystems and their communication.

CO3: Fundamentals of plant succession and adaptations and biogeochemical cycles.

CO4: Skill development practices in organic farming.

**Practical CO:** Students will handle and understand the analytical and instrumentation skills, and various ecological fields parameters and skill based biopreneurship through hydroponics and organic farming.

## **SEMESTER-VI**

### **PAPER-I: (Biochemistry, Biotechnology and Herbal Technology)**

Course outcome: *Students will be able to*

CO1: Basic concepts of Biochemistry, Lipids metabolism, of enzyme action and mechanism.

CO2: To acquire knowledge in Plant tissue culture, Methods of sterilization and Preparation of Culture Media, Protoplast culture and Applications of tissue culture.

CO3: Understand the fundamentals of Genetic engineering including Cloning vectors and Agro bacterium mediated gene transfer and its role in crop improvement.

CO4: Skill Development practices in Herbal, Dye yielding and cosmetics technology.

### **Paper-II: (Phytogeography, Utilization of Plants, Techniques and Pharmacognosy)**

Course outcome: *Student will understand the basics and fundamental of*

CO1: Phytogeography, Pollution, Natural resources and Conservation strategies.

CO2: Utilization of plants, branches and scope of ethnobotany.

CO3: Principle, types and application of Microscopy and various biophysical techniques CO4:

Skill development practices in Pharmacognosy.

**Practical-CO:** The course aims at the concept, scope, instrumentation, basic requirements and applied aspects of biochemistry, biotechnology, and skill based biopreneurship through utilization of plants, pharmacognosy, medicine, and herbal product development.

Program Outcomes and Course Outcomes Session 2018-2019



## PROGRAM OUTCOMES AND COURSE OUTCOMES 2018-2019 ONWORDS

### **Botany Programme Specific Outcome**

- Know the characteristics, systematics, morphology, structure and life cycle pattern of Viruses, Mycoplasma, Bacteria, Cyanobacteria, Algae, Fungi, Lichens, Bryophytes and Pteridophytes.
- Understand the diversity, systematics and biology of seed plants.
- Understand the nature and basic concepts of cell biology, genetics, anatomy, morphology, Biochemistry, Physiology, Taxonomy and ecology.
- Analyze the interrelationships among prokaryotic and eukaryotic organisms
- Study of organization and function of the gene, genome, cell, tissue, organ and organ system including development, reproduction, ecological and physiological adaptations and behavior of different forms of life.
- Understand the importance of plants, their diversity and its conservation.
- Achieve pure and applied botanical knowledge.
- Perform procedures as per laboratory standards in the areas of Biochemistry, Physiology, Biotechnology, Taxonomy, Economic Botany and Ecology
- Demonstrate hands on skill in the experimental techniques and methods of analysis in various field of Botany.
- Generate test hypotheses, observations, data, analyze and interpret results, derive conclusions, and evaluate their significance within a broad scientific context.
- Promotes stewardship responsibility, entrepreneurship skill, research and career opportunities.

## COURSE OUTCOMES

<b>B.Sc. SEMESTER-I</b>	<b>PAPER-I (Viruses, Prokaryotes &amp; Algae)</b>	<ul style="list-style-type: none"> <li>To study in depth about Viruses, Prokaryotes &amp; Algae.</li> <li>To gain knowledge about microbial diversity.</li> <li>To Know the General characteristics, systematics, morphology, Ultramicroscopic cell structure and life cycle pattern of Viruses, Mycoplasma, Bacteria, Cyanobacteria and Algae.</li> <li>To Understand the useful and harmful activities of Viruses, Mycoplasma, Bacteria, Cyanobacteria and Algae.</li> <li>Learn about the General characteristics, Classification (Fritsch 1954) of Algae.</li> </ul>
	<b>PAPER-II (Fungi, Lichen, Plant- Pathology&amp; Bryophyta)</b>	<ul style="list-style-type: none"> <li>To give information about Fungi, Lichen, Plant Pathology&amp;Bryophyta and their life cycle.</li> <li>Know the General characteristics, Classification of Fungi &amp; Bryophyta.</li> <li>To make them Understand the Life history of <i>Albugo</i>, <i>Mucor</i>, <i>Puccinia</i>, <i>Cercospora</i>, <i>Riccia</i>, <i>Anthoceros</i>, <i>Funaria</i>.</li> <li>To explore host, pathogen, symptoms, Causes and Control of Leaf curl of Papaya, Citrus canker and Red rot of Sugarcane □ To Understand the types, Reproduction in Lichens.</li> <li>Know about the Economic importance of Fungi, Lichen and Bryophyta</li> </ul>
<b>PRACTICAL PAPER I &amp; II</b>		<p><b>Students should understand,</b></p> <ul style="list-style-type: none"> <li>Study of Bacterial forms, <i>Nostoc</i>, <i>Oedogonium</i>, <i>Chara</i>, <i>Vaucheria</i>, <i>Ectocarpus</i>.</li> <li>Study of <i>Albugo</i>, <i>Mucor</i>, <i>Puccinia</i>, <i>Cercospora</i>, Lichen, Plant pathology, <i>Riccia</i>, <i>Anthoceros</i> and <i>Funaria</i>. □ Botanical Excursions</li> </ul>
<b>B.Sc. SEMESTER -II</b>	<b>PAPER-I (Pteridophyta &amp; Gymnosperm)</b>	<ul style="list-style-type: none"> <li>Know about the Classification system General characters, Economic importance, alternation of generation of Pteridophyta and Gymnosperms.</li> <li>To make them know the life history of <i>Rhynia</i>, <i>Selaginella</i>, <i>Equisetum</i>, <i>Cycas</i>, <i>Pinus</i>, and <i>Cycadeoidea</i>.</li> </ul>
		□ To study the concepts of Apogamy, Apospory, Stelar system in pteridophytes, heterospory and seed habit.

	<b>PAPER-II (Palaeobotany &amp; Morphology of Angiosperms)</b>	<ul style="list-style-type: none"> <li>• Study of geological time scale, fossilization, types of fossils and fossil plants.</li> <li>• Understand the fossil genera <i>Glossopteris</i> representing fossil groups.</li> <li>• To Understand the Root, Stem and Leaf Morphology of Angiosperms.</li> <li>• To be familiar with types Inflorescence and details of typical flower including various parts.</li> <li>• To provide information about classification and types of fruits.</li> </ul>
<b>PRACTICAL PAPER I &amp; II</b>		<ul style="list-style-type: none"> <li>• To learn about the structure and reproduction of certain selected species of Pteridophytes and Gymnosperms.</li> <li>• To Study Fossils, types forms, and modification of Root, Stem, Leaf, Inflorescence, Flowers and Fruits.</li> <li>• Study Tour</li> </ul>
<b>B.Sc. SEMESTER -III</b>	<b>PAPER-I (Angiosperm Taxonomy)</b>	<ul style="list-style-type: none"> <li>• To study Origin and Phylogeny of Angiosperm &amp; Fossil Angiosperms</li> <li>• Comprehend the concepts of plant taxonomy and classification of Angiosperms.</li> <li>• To give knowledge about Phytochemistry cytology and evolutionary relationship among taxonomic groups.</li> <li>• To understand the comparative account of selected angiosperms families and its economic value.</li> </ul>
	<b>PAPER-II (Cell Biology, Plant Breeding &amp; Evolution)</b>	<ul style="list-style-type: none"> <li>• Cell biology give knowledge about structure of typical plant cell, cell organelles &amp; their structure, chemistry and functions.</li> <li>• To study chromosome organization and cell division in plants and their significance.</li> <li>• To understand the various techniques in plant breeding, biostatistics and theory of evolution.</li> </ul>
<b>PRACTICAL PAPER I &amp; II</b>		<ul style="list-style-type: none"> <li>• Study of Angiospermic Families- Malvaceae, Brassicaceae, Fabaceae (Papilionoideae, Caesalpinioideae, Mimosoideae), Asteraceae, Asclepiadaceae, Euphorbiaceae and Poaceae.</li> <li>• Study of fossil Angiosperms micropreparation and specimens: <i>Sahianthus</i>, <i>Enigmocarpon</i></li> <li>• To study Cell division- mitosis &amp; meiosis in plant material.</li> <li>• To calculate Mean, Mode, Median, standard error, the student's tvalue.</li> <li>• Botanical Excursion</li> </ul>
<b>B.Sc. SEMESTER- IV</b>	<b>PAPER-I (Angiosperm Anatomy&amp;</b>	<ul style="list-style-type: none"> <li>• To describe Angiosperm Anatomical &amp; Embryological characters related to study of plants.</li> <li>• To study tissues and their functions.</li> </ul>

	<b>Embryology)</b>	<ul style="list-style-type: none"> <li>• Understand the various components of root &amp; stem and its primary and secondary growth.</li> <li>• Types of vascular bundles- dicots and monocots in dicot and monocot plants; Secondary growth and anomalous secondary growth in <i>Bignonia</i> and <i>Dracaena</i> stem.</li> <li>• Anatomy of leaf: Dicot (<i>Nerium</i>), monocot (<i>Maize</i>).</li> <li>• Learn about double fertilization and their significance. Be enlightened about the mechanism of pollination and basic structure and development of the embryo.</li> </ul>
	<b>PAPER-II (Genetics &amp; Molecular Biology)</b>	<ul style="list-style-type: none"> <li>• Knowledge about Mendelism, genes interaction, linkages, crossing over, chromosome variation</li> <li>• To understand the biochemical nature of nucleic acids, their role in living systems.</li> <li>• To understand the process of gene expression synthesis, genetic code and operon concept.</li> </ul>
<b>PRACTICAL PAPER I &amp; II</b>		<ul style="list-style-type: none"> <li>• To Study simple tissue, complex tissue and secretory tissue, types of vascular bundles, internal structure of dicot and monocot root <i>Sunflower; Maize.</i>, internal structure of dicot and monocot stem <i>Sunflower; Maize</i>, internal structure of secondary growth and anomalous secondary growth - <i>Bignonia</i> and <i>Dracaena</i> stem, internal structure of leaves- <i>Nerium, Maize</i>.</li> <li>• To Study of types of ovules, anther structure, pollen grains, adaptations for pollination</li> <li>• To calculate the percent pollen germination in the given anthers. □ To prove the Mendel's law of segregation and independent assortment with the help of coloured beads.</li> <li>• To workout the type of gene interaction in the given cross.</li> <li>• Visit to Research Laboratories, Industries, Nurseries, Field visit.</li> </ul>
<b>B.Sc. SEMESTER -V</b>	<b>PAPER-I Biochemistry &amp; Plant Physiology-I</b>	<ul style="list-style-type: none"> <li>• To give knowledge about Biochemistry &amp; Plant Physiology-I</li> <li>• Study of Carbohydrates, Lipids and Amino acids and basics of Enzymology.</li> <li>• To study Plant-water relations and mineral nutrition.</li> <li>• Study the process of respiration and photosynthesis in higher plants</li> <li>• Know the nitrogen metabolism and its importance.</li> </ul>
	<b>PAPER-II Plant Ecology I</b>	<ul style="list-style-type: none"> <li>• To study of basics of ecology and environmental factors</li> <li>• To provide knowledge about natural resources and their importance in sustainable development.</li> <li>• Know the importance of ecosystem-components, Food chain, Food web, Ecological pyramids.</li> <li>• Understand plant communities, Climatic &amp; Phytogeographic regions of India.</li> </ul>

	<ul style="list-style-type: none"> <li>• To understand by performing some physiological and ecological experiments</li> <li>• To study the effect of various chemicals on permeability of</li> </ul>				
<p align="center"><b>PRACTICAL PAPER I &amp; II</b></p>	<p>membranes, the ascent of sap in suitable plant material, to separate chlorophyll pigment by paper chromatography, to determine the RQ of given plant material, to perform microchemical tests for determination of reducing and nonreducing sugars, starch, cellulose, oils and proteins, to study the effect of light intensity and quality, CO<sub>2</sub> concentration and temperature on rate of photosynthesis by suitable method, to determine osmotic potential of the cell sap by plasmolytic method, to study the activity of enzyme amylase, catalase and peroxidase.</p> <ul style="list-style-type: none"> <li>• To determine frequency, density, abundance of the community by quadrat method, to determine the homogeneity of vegetation by Raunkiers frequency diagram, to determine the water holding capacity of the given soil samples, to determine the water rising capacity of the given soil samples, to determine the soil moisture of the given samples.</li> <li>• Botanical Excursion.</li> </ul>				
<p><b>B.Sc. SEMESTER- VI</b></p>	<table border="1"> <tr> <td> <p><b>PAPER-I Plant Physiology- II &amp; Biotechnology</b></p> </td> <td> <ul style="list-style-type: none"> <li>• Know the scope of plant physiology &amp; biotechnology.</li> <li>• To understand Growth Concept, Phytochromes, biological clock, plant growth regulators and plant movements.</li> <li>• Understand the concept of Photoperiodism and vernalization, □ To learn Seed dormancy and plant defence mechanism.</li> <li>• Understand the basics of genetic engineering and tissue culture techniques and its application.</li> </ul> </td> </tr> <tr> <td> <p><b>PAPER-II (Plant Ecology- II, Techniques &amp; Utilization of Plants)</b></p> </td> <td> <ul style="list-style-type: none"> <li>• Understand the Plant succession, Morphological, Anatomical &amp; Physiological adaptations.</li> <li>• Learn about Environmental Pollution, management, natural and resources.</li> <li>• Learn skill on working Principles, types and application of: microscopy, centrifugation, electrophoresis, spectroscopy, chromatography, pH meter.</li> <li>• Knowledge about utilization of plants and ethno botany to enable the student about utility in life.</li> </ul> </td> </tr> </table>	<p><b>PAPER-I Plant Physiology- II &amp; Biotechnology</b></p>	<ul style="list-style-type: none"> <li>• Know the scope of plant physiology &amp; biotechnology.</li> <li>• To understand Growth Concept, Phytochromes, biological clock, plant growth regulators and plant movements.</li> <li>• Understand the concept of Photoperiodism and vernalization, □ To learn Seed dormancy and plant defence mechanism.</li> <li>• Understand the basics of genetic engineering and tissue culture techniques and its application.</li> </ul>	<p><b>PAPER-II (Plant Ecology- II, Techniques &amp; Utilization of Plants)</b></p>	<ul style="list-style-type: none"> <li>• Understand the Plant succession, Morphological, Anatomical &amp; Physiological adaptations.</li> <li>• Learn about Environmental Pollution, management, natural and resources.</li> <li>• Learn skill on working Principles, types and application of: microscopy, centrifugation, electrophoresis, spectroscopy, chromatography, pH meter.</li> <li>• Knowledge about utilization of plants and ethno botany to enable the student about utility in life.</li> </ul>
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<p style="text-align: center;"><b>PRACTICAL PAPER I &amp; II</b></p>	<ul style="list-style-type: none"> <li>• Learn about the ecological adaptations and human interference in environment as analysis of water samples provides great concern towards environmental audit.</li> <li>• To determine seed viability, the effect of various plant growth regulators on the growth and development of plants.</li> <li>• To study the morphological and anatomical characteristics hydrophyte and xerophytes, the morphological characteristics of cladode, phylloclade, phyllode and pneumatophores.</li> <li>• To determine the DO, salinity (chlorides), transparency, pH and temperature of water samples different sources.</li> <li>• To study the dust holding capacity of leaves, the percent leaf-area injury of different leaf samples collected around polluted sites.</li> </ul>
	<ul style="list-style-type: none"> <li>• Learn about the utilization of Plants: Morphology, Utilization and Important chemical constituents of plants.</li> <li>• To study the plants of Ethnobotanical importance.</li> <li>• Electrophoretic/chromate graphic separation of amino acids carbohydrates.</li> <li>• Botanical Excursions</li> </ul>