

## **DEPARTMENT OF BOTANY**

### **PAPER –I VIRUSES, BACTERIA, CYANOBACTERIA, ALGAE, FUNGI, LICHENS AND PLANT PATHOLOGY.**

#### **COURSE LEARNING OUTCOME (CLO)**

1. Discuss about importance of morphological structure classification, reproduction and economic importance of algae.
2. Study and impart knowledge about in general characteristics, structure, reproduction, life history and economic importance of fungi understand the features of lichens.
3. Know the control measures of plant diseases.
4. Learn the microscopic technique, familiarize with the external & internal structure of lower & higher group of organisms.
5. Students get knowledge in fossil & fossilization.
6. Students are capable to gain practical knowledge about micro preparation and observation of permanent slides of genera.
7. Understand the ultrastructure and dynamism of cell.
8. Interpret the different structures of viruses and its multiplications.
9. Inculcate the importance of plant disease.
10. Identify the causative organism symptoms & control measure of plant disease.
11. Understand the knowledge of host parasite interaction in Lichens.

#### **PROGRAMME OUTCOME**

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#### **PROGRAMME SPECIFIC OUTCOME**

1. Know the terminologies in plant pathology.
2. Understand the scope and importance of plant pathology
3. Know the prevention & control measures of plant diseases and its effort on economu of crops.
4. Understand the diversity of Algae.
5. Know the systematic, morphology & structure of Algae.

6. Understand the useful & harmful activities of Algae.
7. Know the economic importance of fungi.

## **PAPER– II BRYOPHYTES, PTERIDOPHYTES, PALEOBOTANY AND GYMNOSPERMS.**

### **LEARNING OUTCOME :**

To get knowledge about classification, mode of reproduction and detailed study of some important bryophytes.

To impart knowledge to general characters, classify and stellar evolution in Pteridophytes.

To understand the Phylogeny from Bryophytes.

To know the evolution of saphrophytes in bryophytes students will be conversant with general characters morphology and anatomy of Cycas, pinus and Gnetum.

Students gets knowledge in the methods of fossil & fossilization.

### **COURSE OUTCOMES:**

The importance of Bryophytes, Pteridophytes, Gymnosperms and paleobotany will be discussed in this paper. For example Bryophytes are important in initiating soil formation on barren terrain in maintaining soil moisture, and in recycling nutrients in forest vegetation. Indeed, discerning the presence of particular bryophytes is useful in assessing the productivity & nutrient status of forest types. Further, through the study of bryophytes, various biological phenomena have been discovered that have had a profound influence on the development of research in such areas as genetics and cytology. In this study, it gives the awareness to the students of the importance of conservation of this species for future aspects.

### **PROGRAMME SPECIFIC OUTCOMES:**

1. Understand the morphological diversity of Bryophytes & Pteridophytes & Gymnosperms.
2. Understand the economic importance of Bryophytes.
3. Know the taxonomic position, occurrence, thallus structure, reproduction of Bryophytes.
4. Know the scope of paleobotany, types of fossils, its role in global economy and geological time scale.

5. Understand the various fossil groups.
6. Understand the diversity of Gymnosperms in India.
7. Know the evolutionary trends & difficulties of living gymnosperms with respect to external & internal features..

## **PAPER– III MORPHOLOGY, TAXONOMY OF AUGIOSPERMS AND ECONOMIC BOTANY.**

### **COURSE LEARNING OUTCOME :**

1. Understand external structure of plants.
2. Acquire knowledge and classification of plant families their characteristics and its economic importance.
3. Understand different systems of traditional medicines.
4. Acquire knowledge on collection and processing of herbal drugs.
5. Get knowledge in pharmacological importance of medicinal plants and its bioactive compounds.
6. Acquire knowledge on different adulterants.
7. Learn about common medicinal and aromatic plants in India.
8. Understand classical and modern system of classification.
9. Acquire knowledge on molecular tools for classification.
10. Get knowledge on important plant families their characteristics and its economic importance.
11. Impart knowledge on various tribal groups of Karnataka and their ecological knowledge.

### **COURSE OUTCOME:**

1. Plant morphology represents a study of the development form & structure of plants and by implication an attempt to interpret these on the basis of similarity of Plant & origin, Plant morphology is useful in the visual identification of plants. Systematic Botany helps to study the arrangements of plants in different families & students get chance to identify plants in surrounding localities. The study of economic Botany helps to the importance and uses of Plants and plant parts. Economic Botany gives the knowledge of different parts of plants like cloves which is used as a bud and pea as seed and leaves as tobacco etc.

## **PROGRAMME OUTCOMES:**

1. Systematic Botany helps to arrange the plants naturally & phylogenetically.
2. The study of economic Botany helps us to know the importance and uses of plants and plant parts. Aware the students to understand the evolution and its importance. In these way knowledge of evolution can improve the quantity of human life.

## **PROGRAMME SPECIFIC OUTCOMES:**

Students will be able to identify the major groups of organisms with an emphasis on plants and be able to classify them within a phylogenetic framework. Students will be able to compare & contrast the characteristics of plants, algae & fungus that differentiate them from each other and from other forms of life. Know the floral variations in angiospermic families, their phylogeny & evolution. Understand various rules principles & recommendation of plant nomenclature produces in plant identification. Understand major evolutionary trends in various parts of angiosperm plants.

## **PLANT ANATOMY AND REPRODUCTIVE BOTANY**

Learning Outcomes

### **PAPER V**

1. Plant anatomy and Embryology are much awaited subject to study the internal structures and structure and function of reproductive organs in plants..
2. The course paper cover basic aspects of anatomy of plant tissues such as meristems, epidermics, perusment tissues, complex tissue systems and structure of plant organs, reproductive developmental aspects of male reproductive system- Pollen grains, female reproductive system- embryo sac.
3. Students will be benefitted by studying the plant anatomy enables to identify fragmentary plant materials, wood, forensic investigation and applied aspects of mires terms cultural.
4. Students will be able to utilize embryological studies in varios aspects of like analysis of evolutionary trends, circumscription & delimitation of taxa and making a discussion on systematic positions.
5. Laboratory course: students able to understand the internal structure of monocot and dicot (stem, leaf & root) secondary thicnekings, anamolous secondary thickening (Dicot, monocot, nodal anatomy) and anamolons secondary growth in dicot stems like Bunganvillea, Boerhava & Amaranthuns.
6. Students get knowledge in internal structure of anther and isolation of endosperm.

## **COURSE OUTCOME :**

Angiosperm anatomy is often viewed as a source of independent data that may be used to assess evolutionary relationships among angiosperms. Comparative anatomical studies document suit of correlated characters that have been interpreted as general evolutionary trends, of which several have been asserted to be irreversible. After the completion of the study, an expert student or an expert person in anatomical studies may be able to identify any wood samples without plant leaf or flowers.

## **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

Students can know the methods of pollination and fertilization.

- 1) They can gain the knowledge of fertilization, formation of endosperm and embryology.
- 2) They can understand the scope & importance of anatomy.
- 3) They can know the various tissue systems.
- 4) They can understand the normal & anomalous secondary growth in plants and their causes.
- 5) They can perform the various techniques in anatomy.

## **PLANT PHYSIOLOGY, PLANT BIOTECHNOLOGY**

### **Course Learning outcome :**

- 1) To become knowledgeable in plant & its water relations.
- 2) Students will be able to gain knowledge on role of micronutrients in plant growth, their development and understand the mechanism of nitrogen metabolism.
- 3) To gain knowledge about chloroplast structure photosynthetic pigments, or path of energy from the light reactions through calvin cycle. Students are able to understand the process of translocation of organic solutes in plants.
- 4) To understand the energy releasing steps in cytolysis. Students will be familiar about the mechanism of respiration.
- 5) To acquire knowledge in plant growth regulator and its uses, understand the physiology of flowering and photoperiodism.
- 6) Students can gain practical knowledge of estimation of sugars, lipids and proteins and also separation of plant pigments by chromatography.
- 7) Students can learn about plasmolysis, they can be influenced of light intensity on transpiration, stomata size and number are responsible for transportation rate different

coloured light are important for oxygen evolution, respiration rates are measured by using germinating seeds with Respiroscope.

- 8) Plant Biotechnology : Can understand the basic principles of plant tissue culture. It also elaborates the detailed aspects of in-vitro culture techniques and genetic engineering of transgenic plants.
- 9) Students will be able to learn the scope of plant tissue culture technology, knowledge in molecular tools such as enzymes, nomenclature, different types of vectors, DNA markers and blotting techniques.

### **COURSE OUTCOMES :**

Plant Physiology- The knowledge of plant physiology will help in forgoing several advances in agriculture horticulture, forestry, plant pathology and other disciplines of botany. In fact, researches in plant physiology have been and are likely to contribute immensely to crop improvement. Increase in crop productive is based on exploiting maximal levels or plant metabolic processes.

The study of Biotechnology may help to create awareness in use of biological process, organisms or systems to manufacture products intended to improve the quality of human life and also biotechnology involves industrial process such as production of new chemicals or the development of new fuels for vehicles.

### **PROGRAMME SPECIFIC OUTCOMES:**

Plant physiology – On completion of the course, students are able to.

1. Know the importance and scope of plant physiology.
2. Understand the plants and plant cells in relation to water.
3. Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C<sub>3</sub> and C<sub>4</sub> pathways.

Learn about the movement of sap and absorption of water in plant body.

Understand the plant movements.

Learn and understand about mineral nutrition in plants. Know about photosynthesis a respiration in plants. Understand the process of translocation of solutes in plants. Know the nitrogen metabolism its importance.

Biotechnology : on completion of the course students are able to understand.

1. About the genomic organization of living organisms, study of genes genomes, chromosome etc.

2. Gain knowledge about the mechanism and essential component required for prokaryotic DNA replication.
3. Understand the fundamentals of Recombinant DNA technology.
4. Know about genetic engineering.

Understand the principle and basic protocols for plant tissue culture.