

**M.G.S.S.Himayatnagar.  
Hutatma Jaywantrao patil  
Mahavidyalay Himayatnagar.Dist  
Nanded.**

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**Dr.Ingle Shyam L.  
Department of Botany**

**Programmer Specific Outcomes-  
(Botany)**

- ❖ National and global level opportunities to pursue M.Sc. and Ph.D. programs.
- ❖ Enormous job opportunities at all level of Conservationist Ecologist, Environment and Consultant
- ❖ To impart the botany knowledge of national and global standards.
- ❖ Discipline specific competitive examination conducted by different organization
- ❖ Improvement in the quality of higher education
- ❖ To acquire skills, training and knowledge to enhance their thinking.
- ❖ Upgrading academic resources and learning environment
- ❖ Science program should make students centric, interactive and outcome oriented
- ❖ To motivate and inspire the students to create deep interest in science

# Course outcomes

B.Sc. First Year

Semester-I (paper wise)

1.Name Of The Paper-I Viruses, bacteria, Algae, Fungi, Lichens And Mycorrhiza

- a. To study and impart knowledge about the occurrence, distribution, structure and life history
- b. To instill in students and appreciation for the diversity of plant forms and structural organization that exists within the plant body that allow plants to develop and live as integrated organisms in diverse environments
- c. Understand the morphology, structure and importance of the various organism
- d. Differentiate between various group of algae, fungi, bacteria, viruses, lichens and mycorrhiza
- e. Learn the life cycles of individual belonging to algae, fungi, bacteria, viruses, lichens and mycorrhiza

2.Name of the paper -II Plant Ecology, Phytogeography and Environmental Biology:

- a. Acquainted with basic concepts of Ecology, Ecosystem Ecological factors, community ecology and phytogeography
- b. To provide students with skills necessary for Ecological studies
- c. Able to understand the ecological principles, interactions taking place in the Ecosystems and the flow of energy.
- d. Learn about the concept of phytogeography and its relations with other disciplines

Semester-II

1.Name of the Paper- III Bryophytes, Pteridophytes, Gymnosperms & Paleobotany

- a. To study the occurrence, distribution, structure and life history of bryophytes
- b. To provide students with skills in paleobotany studies
- c. Learn the life cycles of individuals belonging to Bryophytes, Pteridophytes and Gymnosperms

d. Learn about process of fossil formation and fossils plants

## 2. Name of the Paper – IV Taxonomy of

Angiosperms:

- a. To study the types of classifications artificial. Natural and phylogenetic
- b. To study the principles and rules of ICN and taxonomical terminology
- c. To study the various plant families and their economic importance
- d. Proficiency with the basic terminology of plant morphology
- e. Able to identify the major families of plants and their economic importance
- f. Understand the methods of collecting and preserving Plants

## 3. Name of the Paper-V PRACTICAL PAPER-V:

BASED ON THEORY PAPERS-I, II, III & IV(Annual)

- a. Study of morphology of Bacteria by Gram staining method
- b. Study of citrus canker disease
- c. Study of symptoms of yellow vein mosaic of Bhendi
- d. Study of Algae: Systematic position and external features of nostoc, Oedogonium, Ectocarpus
- e. Study of Fungi: systematic position, external and internal features of Penicillium, Alternaria, Agaricus
- f. Study of different forms of Lichens
- g. Study of ectomycorrhiza and endomycorrhiza
- h. Study of Marchantia- morphology of thallus, w.m. rhizoids and scales, v.s. thallus through gemma cup, w.m. gemmae (all temporary slides), v.s. Of antheridiophore, archegoniophore, L.S. of sporophyte(all permanent slides )
- i. Study of Funaria- Morphology, W.M. leaf, rhizoids

,operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, L.S.of capsule and protonema .  
j. Lycopodium- morphological and anatomical study

### B.Sc. Second Year Semester – III

#### 1. Name of the Paper - VI Plant Anatomy.

- a. To know about the internal structure of the most evolved group of plants, the Angiosperm
- b. To study cells, tissues, meristem, epidermal and vascular tissue system in plants.
- c. To acquire knowledge of tissue systems, histology and growth patterns in plants .
- d. The students will be able to understand the meristem (RAM & SAM) different simple and complex tissues and secondary growth in root and stem.
- e. Students will acquire knowledge of anatomy of root stem and leaf in dicot and monocot plants..

#### 2. Name of the Paper - VII Plant Physiology and Biochemistry:

- a. 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.
- b. To acquaint the students with the types and their functions of different biomolecules and secondary metabolites
- c. To know the role of different plant growth regulators in plant physiology..
- d. 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.

e. Students shall learn different types of biomolecules and secondary metabolites

f. Students will learn the flowering physiology, vernalization and seed dormancy in plants

I Semester – IV

Name of the Paper – VIII Plant Embryology:

a. To study the flowering and fruiting, reproduction process, role of pollinators, ovule fertilization, Endosperm and seed development in angiosperms.

b. This course will be able to demonstrate foundational knowledge in embryology of plants

c. Students will be able to understand the development of pollen, Ovule, and fertilization and palynological information

2. Name of The Paper-IX Plant Metabolism and Biotechnology

a. To study of different pathways in photosynthesis, respiration, nitrogen metabolism

b. To gain the knowledge of basic aspects and applications of plant tissue culture

c. To study the different aspects of genetic engineering and bioinformatics

d. Students will be able to understand the various Metabolic process such as photosynthesis, respiration, nitrogen metabolism etc. which are important for life

e. Students shall be become familiar with the gene cloning and its transfer in plants

3. Students shall learn different databases and their applications

f. Students should learn thermal and photochemical reactions

4. Name Of The Paper- X based on Theory Paper-VI & VII

a. 1. 1. Study of Meristematic tissues (Study of root apex and shoot apex) with the help of Slides/ Models/Charts/ Photocopies (2 practical's)

- b. Study of tissues, Parenchyma, Collenchyma, Sclerenchyma, Xylem and Phloem (Permanent slides only) (2 practical's)
- c. Maceration of tissues and the observation of sclereids-Type, Vessels-thickening
- d. Study secretory tissues with the help of Slides/Models/Charts/ Photocopies
- e. Study of Epidermal tissue system: stomata types; trichomes: no trichomes: non-glandular and glandular
- f. Microtomy: dehydration, clearing and embedding of material, section cutting, dewaxing
- g. Preparation of a double stained permanent slide of stem of Maize, Sunflower, Achylamandes Mirabilis, Bignonia and Dracaena, for the study of internal structures (6 practical's )
- h. Study of wood specimens for Heart wood, sap wood etc
- i. Study of Leaf anatomy: Dicot and Monocot leaf (only Permanent slides)
- j. Study of root anatomy: Monocot: Zea mays; Dicot: Helianthus; Secondary growth: Helianthus (only Permanent slides).

## **5.Name of The Paper- XI: BASED ON THEORY PAPERS-VII & IX**

1. To determine the water potential of potato tuber
2. To determine the osmotic potential of vacuolar sap by plasmolysis
3. To study the effect of temperature/ organic solvent/concentration of different organic solvents on permeability of plasma membrane (beet root) by using colorimeter/Spectrophotometer
4. Separation of photosynthetic pigments by paper chromatography
5. To study the effect of light intensity on rate of photosynthesis

6. Determination of RF value and identification of amino acids in a mixture
7. Preparation of standard graph of starch/glucose using colorimeter/spectrophotometer and determination of starch/glucose content of the given plant material
8. Preparation of standard graph of protein using colorimeter/spectrophotometer and determination of protein content from given plant material
9. To estimate the percentage of oil content in given oil seeds using Soxhlet extractor.
10. Study of catalase activity under PH and temperature

B.Sc.Third Year

### **Semester-V**

1. Name Of The Paper-XII : Plant Physiology (Compulsory) :

- a. To make students realize how plants function, namely the importance of water, mineral, hormones and light in plant growth and development; understand transport mechanisms and translocation in the phloem, applications of plant physiology
- b. To acquaint the students with the types and their functions of different biomolecular and secondary metabolites
- c. To know the role of different plant growth regulators in plant physiology
- d. Students will gain the knowledge of water and nutrient uptake, movement in plant, role of mineral elements, translocation of sugars, role of various plant growth regulators, phytochrome in plants
- e. Students will learn the flowering physiology, vernalization and seed dormancy in plants

2. Name Of The Paper -XIII Systematic Botany- I

- a. To study the Various Plants in Marthwada Region

- b. To study the Dicot Family that is Polyp tale And Gamopetale.
- c. To study Econmic importance of Plants .

#### Semester - VI

#### 1. Name of the Paper - XIV Plant Metabolism, Biochemistry and Biotechnology (Compulsory):

- a. To study of different pathways in Photosynthesis. respiration, nitrogen metabolism
- b. To gain the knowledge of basic aspects and applications of plant tissue culture
- c. To study the different aspects of genetic engineering and bioinformatics.
- d. Students will be able to understand the various metabolic processes such as photosynthesis, respiration, Nitrogen metabolism etc, which are important for life.
- e. Students shall be become familiar with the gene cloning and its transfer in plants
- f. Students shall learn different databases and their applications.
- g. Students should learn thermal and photochemical reactions.

#### Name of the Paper-XV Systematic Botany-II

- A. To Study In Detail the Origin of Angiosperm.
- B. To acquire knowledge of different families of monocotyledon .
- C. To Know about the principle of taxonomy.