

# SYLLABUS (CBCS) FOR F. Y. B. Sc. BOTANY

Academic Year 2022-2023

Class : F. Y. B. Sc. (Semester - II)

Paper Code: USBT121

Paper : I

Title of Paper : Diversity of Spermatophytes

Credit : 2

No. of lectures: 36

## A) Learning Objectives:

1. To understand the plant diversity with special reference to phanerogams diversity.
2. To give idea of conservation and economic importance of phanerogams.
3. To in carve the external characteristics of flowering plants in mind of students.
4. To create awareness of local flora.

## B) Learning Outcome:

1. Students will be able to understand phanerogams and to aware about their conservation.
2. Students will get knowledge about the applications of phanerogams.
3. Students will describe morphological characters of flowering plants.
4. Development of plant taxonomists and expert in identification of local flora.

Credit - I (18 L)

## Unit - I

**1.1 Gymnosperms** : Occurrence and General characters, Life cycle of *Cycas*, Economic importance of Gymnosperms. (4L)

**1.2 Angiosperms** : Occurrence and General characters, means of evolutionary success of Angiosperms, comparative account of monocotyledons and dicotyledons. (3L)

**1.3** Types and modifications of root, stem and leaf. (6L)

**1.4 Morphology of Inflorescence** : Types and significance of inflorescence:

Racemose (raceme, spike, corymb, umbel, catkin, spadix and capitulum), Cymose (solitary, monochasial, dichasial, polychasial), Special types (Verticillaster, Cyathium, and Hypanthodium). (5L)

## **Credit - II (18 L)**

### **Unit - II**

**2.1 Morphology of Flower** : Parts of typical flower, Types of flower (complete, incomplete), insertion of floral whorls. Floral whorls : Calyx, corolla, perianth, aestivation, modifications of calyx (pappus, petaloid, spurred). Forms of corolla : polypetalous (cruciform and papilionaceous) gamopetalous (infundibuliform, bilabiate), Androecium : structure of stamen, fixation, cohesion and adhesion of anthers; Gynoecium : structure of carpel. Types of placentation. **(12L)**

**2.2 Morphology of Fruit** : Types of fruits : Simple and dry: Achene, Cypsela, Legume, Follicle and Capsule, Fleshy : Drupe, berry, Hesperidium and pepo. Aggregate : Etaerio of berries and Etaerio of follicles. Multiple fruits : Syconus and Sorosis. **(6L)**

### **References :**

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6. Bierhorst D.W. 1971. Morphology of Vascular Plants. New York and London.
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11. Lawrence, G.H.M 1951. Taxonomy of Vascular Plants.
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14. Singh V. & D.K Jain, 1981 Taxonomy of Angiosperms. Rastogi Pub. Meerut.
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16. Pande B.P 1997. Taxonomy of Angiosperms. S.Chand Publication
17. Gurucharan Singh 2005- Plant systematics
18. Naik V.N. - Taxonomy of Angiosperms.
19. Shivrajan V.V. -Introduction to Principles plant taxonomy
20. Sharma O.P. Plant Taxonomy Tata McGraw-Hill Education

Class : **F. Y. B. Sc. (Semester - II)**  
Paper Code : **USBT 122**  
Paper : **II** Title of Paper : **Industrial Botany - II**  
Credit : 2 No. of lectures : 36

**A) Learning Objectives:**

1. To give knowledge about organic farming with respect to biopesticides and biofertilizers.
2. To give knowledge of medicinal plants and their uses.
3. To make students experts to setup agro-industry.

**B) Learning Outcome:**

1. Students will learn about applications of biopesticides and biofertilizers.
2. Student will get knowledge of pharmacognasy.
3. Students can raise the small scale industries based on agrobased products.

**Credit - I**

**Unit - 1 (18L)**

- 1.1 **Bio-fuel Industry** : Introduction and advantages. Concept of biofuel and its need. Plants used for biofuel production. Biodiesel production from *Jatropha*. Commercial significance. **(6L)**
- 1.2 **Bio-pesticide Industry**: Concept of bio-control; Integrated Pest Management (IPM). Importance of bio pesticides. Types of bio pesticides: Composite biopesticides, Azadiractin and *Trichoderma*. Commercial significance. **(6L)**
- 1.3 **Industrial Mycology** : Introduction, Important genera of fungi used in various industries and their products. Commercial significance. **(6L)**

**Credit - II**

**Unit - 2 (18L)**

- 2.1 **Bio-Fertilizer Industry** : Bio fertilizers : concept and need. Types of bio-fertilizers: Nitrogen fixing biofertilizer: *Rhizobium*, Blue green algae. *Anabaena* associated with *Azolla*. Phosphate solubilizing bacteria, Commercial significance. **(6L)**
- 2.2 **Fruit Processing Industry** : Fruit processing: concept and need. Types of fruit preservations. Type of processed products (canned fruits, fruit pulp, squash, jam, jelly, pickle, Chips and ketchups). Packing industry. **(6L)**

**2.3 Pharmaceutical Industry :** Concept of nutraceuticals and cosmeceuticals and their advantages. Types of pharmaceutical products: Churna, Asava and Arishta. Drug plants with reference to botanical source, active principles and medicinal uses of *Adhatoda vasica*, *Tinospora cordifolia* and *Asparagus racemosus*. (6L)

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2. The Organic Farming Manual: A Comprehensive Guide to Starting and Running a Certified Organic Farming [Ann Larkin Hansen] (2010) : Storey Publications.
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23. The Complete Technology Book on Biofertilizer and Organic Farming. (2013) : NIIR Board.

Class : **F. Y. B. Sc. (Semester - II)**  
Paper Code : **USBT123**  
Paper : **III** Title of Paper : **Practical - II**  
Credit : **2** No. of Practicals : **11**

**A) Learning Objectives :**

1. To give knowledge of handling of microscope and identification of higher plants.
2. To introduce the students with botanical terms for description of flowering plants.
3. To give hands-on training of production of agro products.

**B) Learning Outcome:**

1. Creation of expert taxonomist.
  2. Students will be able to describe flowering plants scientifically.
  3. Students can raise the small scale industries like biopesticides, biofertilizers and fruit processing.
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1. Study of *Cycas*. 1P
  2. Modifications of root and stem. 1P
  3. Study of leaf (types: simple and compound; sessile and petiolate; venation: parallel and reticulate and modifications). 1P
  4. Study of Inflorescence a) Racemose: Raceme, Spike, Spadix, Catkin, Umbel and Capitulum. b) Cymose: Solitary cyme, Uniparous cyme: helicoid and scorpioid, Biparous cyme and Multiparous cyme. c) Special type: Verticillaster, Hypanthodium and Cyathium. 1P
  5. Study of flower with respect to Calyx, Corolla and Perianth. 1P
  6. Study of flower with respect to Androecium and Gynoecium. 1P
  7. Study of fruits with suitable examples : Simple fruit: fleshy - Berry and Drupe; Dry: Achene, Cypsella and Legume Aggregate fruit: Etaerio of follicles and Etaerio of Berries. Multiple fruit: Syconus and Sorosis. 1P
  8. Study of Biopesticides. 1P
  9. Study of industrially important fungi and their products : *Ganoderma*: *Ganoderma* tablets, *Aspergillus* : citric acid; *Yeast*: Bakery products; *Penicillium*: Penicillin 1P

10. Study of Biofertilizers. 1P

11. One botanical excursion to study phanerogam's diversity / Visit of Agrobased Industry (Study / visit report is compulsory). 1P

**(Note: Visit mentioned in the practical No. 11 is compulsory. It carries 10 marks at the time of practical examination).**