

(Effective from June 2019)

Semester	Paper No.	Title	
III	301	Plant Physiology and Plant Ecology	
	302	Plant Anatomy, Plant Embryology and Genetics	
	303	Diversity of Gymnosperms and Angiosperms	
	Pra. 304	Practical 304	
	ID	Nutrition and Dietetics (I.D.)	
IV	401	Lower Cryptogams	
	402	Higher Cryptogams	
	403	Plant Geography, Economic Botany, Seed Plants and Plant Pathology	
	Pra. 404	Practical 404	
	ID	Biodiversity (I.D.)	



BOT 301 : Plant Physiology and Plant Ecology

Unit - I Plant Physiology I

(A) Water Potential and Root Absorption

- Method, path and types of root absorption
- Factors affecting root absorption

(B) Ascent of Sap

- Introduction
- Ascent of sap by xylem
- Root pressure theory
- Dixon's theory of Cohesion of water

(C) Transpiration

- Introduction
- Types and structure of Stomata
- Mechanism of stomatal transpiration
- Significance of transpiration
- Factors affecting transpiration

Unit - II Plant Physiology II

(A) Respiration

- Introduction
- Types of respiration
- Mechanism of respiration
 - (i) Glycolysis
 - (ii) Kreb's cycle
- Oxydative phosphorylation
- ATP synthesis in aerobic respiration
- Factors affecting respiration

Unit - III Plant Ecology I

(A) Ecosystem

- Concept of Ecosystem
- Types & Components of Ecosystem
- Food chain, Food webs and Ecological Pyramids
- Energy flow in ecosystem

Unit - IV Plant Ecology II

(A) Plant communities:

- Halophytes
- Epiphytes
- Lithophytes

(B) Ecological Factors: Climatic and Edaphic factor

(C) Soil erosion and conservation:

- General introduction, types of soil erosion, factors responsible for soil erosion, control of soil erosion.



BOT 302 : Anatomy, Embryology and Genetics

Unit - I Anatomy I

- Primary tissue structure in Roots
 - Monocot Root
 - Dicot Root
- Primary tissue structure in Stems
 - Monocot Stem
 - Dicot Stem
- Primary tissue structure in Leaf
 - Monocot Leaf
 - Dicot Leaf

Unit - II Anatomy II

- Definition and Study of normal & anomalous secondary growth seen in the following plants.
(i) Bignonia (ii) Nyctanthus (iii) Boerhaavia (iv) Dracena.

Unit - III Embryology I

- Microsporangium and Male gametophyte
 - Structure of Microsporangium, Microsporogenesis and Male Gametophyte.
- Megasporangium and Female gametophyte
 - Structure of Megasporangium, Megasporogenesis and Female Gametophyte.
- Fertilization

Unit - IV Genetics

- Heredity
 - Mendel's experiments
 - Mendel's laws of inheritance
 - Linkage and Crossing over
- Genetic material and it's Structure
 - Chemical Composition of gene
 - Nucleic Acids
 - Structure of DNA
 - Types of RNA



BOT 303 : Diversity of Gymnosperm and Angiosperms

Unit - I Gymnosperm

- Classification with reason, External Morphology, Internal Structure, Reproduction, (Except development) Male gametophyte, Female gametophyte, Fertilization, Germination of seed of following:

- (i) Pinus
- (ii) Gnetum

Unit - II Plant Structure I

- Weak stem plants
- Bracts
- Special types of inflorescence
- Fruits

Unit - III Plant Structure II

- **Pollination**
Pollination Definition, Self-pollination and Cross pollination;
Pollination in Salvia, Ficus, Orchids and Vallisneria
- Defensive devices of plants

Unit - IV Angiosperm

- Plant taxonomy : Principle of Plant taxonomy
- Classification with reasons (according to Bentham and Hooker system), general and distinguishing characters and examples (scientific name) of important plants of the following families.
 1. Brassicaceae
 2. Papilionaceae
 3. Caesalpiniaceae
 4. Mimosaceae
 5. Rubiaceae
 6. Asclepiadaceae
 7. Euphorbiaceae
 8. Pontideriaceae



BOT - 304 :

- The candidates should study the typical vegetation in natural condition and should record their observation in journals. Excursion should be arranged during the year to local places.
- Every candidate shall complete laboratory course in accordance with the regulations issued from time to time by Academic Council on the recommendation of the Board of Studies.
- Every candidate shall record observation directly in the laboratory journal. Every journal shall be signed periodically. At the end of the semester candidate shall produce certified journal during the practical examination.

Practical : 1 To study Physiological experiments for demonstration.

1. To demonstrate anaerobic respiration
2. Release of CO₂ during aerobic respiration. (Conical flask method).
3. To demonstrate that energy is released in the form of heat during respiration.
4. To demonstrate the phenomenon of transpiration. (Bell-jar method)
5. Demonstration of the stomatal transpiration by four leaves method.
6. To demonstrate that water moves through the xylem.

Practical : 2 To Study principle and working method of ecological instruments.

1. Thermograph
2. Hygrograph
3. Anemometer
4. Rainguage
5. Sling Psychrometer
6. Soil thermometer.

Practical : 3 To study ecological peculiarities of Orchid Root and Leaf.

Practical : 4 To study ecological peculiarities of Avicennia Root and Leaf.

Practical : 5 To study primary tissue structure in stem of Sunflower and Maize.

Practical : 6 To study anomalous secondary growth in Bignonia.

Practical : 7 To study anomalous secondary growth in Nyctanthus.

Practical : 8 To study anomalous secondary growth in Boerhaavia.

Practical : 9 To Study permanent slides of Anatomy.

1. Sunflower root T.S.
2. Maize root T.S.
3. Sunflower stem T.S.
4. Maize stem T.S.
5. Sunflower leaf T.S.
6. Maize leaf T.S.
7. Bignonia old stem T.S.
8. Boerhaavia old stem T.S.
9. Nyctanthus old stem T.S.



3. Pollen tetrad
4. Germination of pollen grain
5. Pollinia
6. L.S. of ovule showing megasporogenesis

Practical : 11 (A) To study external morphology and anatomy of pinus needle (leaf).
(Preparation of slides from the fresh/Preserved material by the students)
(B) To Study permanent slides of Pinus.

1. Pinus young stem T.S.
2. Pinus needle T.S.
3. Pinus male cone T.S.
4. Pinus male cone L.S.
5. Pinus female cone T.S.
6. Pinus female cone L.S.

Practical : 12 (A) To study external morphology and anatomy of Gnetum.
{Preparation of slides from the fresh/Preserved material (twig, male cone and female cones) by the students}.
(B) To study Permanent slide of Gnetum.

1. Gnetum young stem T.S.
2. Gnetum old stem T.S.
3. Gnetum Leaf T.S.
4. Gnetum male cone T.S.
5. Gnetum male cone L.S.,
6. Gnetum Female cone T.S.
7. Gnetum Female cone L.S.
8. Gnetum ovule L.S.

Practical : 13 To study weak stem plants.

1. Creepers: Cynodon, Centella
2. Trailers: Boerhaavia diffusa
3. Twiners: Ipomea carica (Ipomea palmata)
4. Dolichos lablab
5. Tendril climber: Passion flower, Vitis sp., Pisum Sp., Clemitis, Tropeolum, Gloriosa superb, Smilax, Antigonon
6. Root climbers: Pothos
7. Scramblers and hook climbers: Rose, Cane, Artobotrys, Zizyphus
8. Adhesive climber: Ficus repens

Practical : 14 To study Bracts.

1. Foliaceous- Adhatoda
2. Petaliod- Bougainvillia
3. Spathy- Colocasia
4. Involucral -Halianthus/Tridex
5. Scaly- Halianthus/Tridex (disk florets)
6. Cupule- Hibiscus
7. Glumes- Maize, grass

Practical : 15 To study special types of inflorescence.

1. Hypanthodium: Ficus
2. Cyathium: Euphorbia



