

Master Success Series

Text Book of

Revised & Enlarged

BOTANY

Paper B

*For B.Sc. (Two Years) Paper B
For B.S. (Four Years) 2nd Semester*



*Plant Systematics, Anatomy
& Development*

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Plant Taxonomy (Systematics)

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Plant Anatomy and Development

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SYLLABUS OF BIOLOGY

**Approved by Higher Education commission (HEC)
for all the Universities of Pakistan**

Plant Systematics (Taxonomy)

1. Introduction to plant systematics its aims, objectives and importance.
2. Classification: importance, brief history; introduction, various systems of classification (Brief account of all the systems).
3. Brief introduction to nomenclature, importance of Latin names and binomial system with an introduction to international code of Botanical Nomenclature (ICBN).
4. Morphology and Phytography - a detailed account of various morphological characters of root, stem, leaf, inflorescence, flower, placentation and fruit types.
5. Diagnostic characters, economic importance and distribution pattern of the following families:
 1. Ranunculaceae
 2. Brassicaceae (Cruciferae)
 3. Fabaceae (Leguminosae): Mimosaaceae, Papilionaceae, Caesalpinaceae
 4. Rosaceae
 5. Euphorbiaceae
 6. Rutaceae
 7. Moraceae
 8. Chenopodiaceae
 9. Cucurbitaceae
 10. Solanaceae
 11. Lamiaceae (Labiatae)
 12. Asteraceae (Compositae)
 13. Liliaceae
 14. Poaceae (Gramineae)

Anatomy and development

1. Cell wall; structure and chemical composition
2. Tissue and Tissue System: Concept: structure and function of various tissues.
3. Structure and development of root, stem and leaf including various types of meristems, Primary and secondary growth of dicot stem.
4. Early development of plant body (embryology) *Capsella bursa-pastoris* or *Arabidopsis*.

SYLLABUS of B.S. (Four years)

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2nd Semester

Title of the Course: Bot - 302 Plant Systematics, Anatomy and

Development

Credit Hours: 4(3+1)

Prerequisites: Bot - 301

Course outline:

a) Plant systematics

1. Introduction to Plant Systematics: aims, objectives and importance.
2. Classification: brief history of various systems of classification with emphasis on Takhtajan.
3. Brief introduction to nomenclature, importance of Latin names and binomial system with an introduction to International Code of Botanical Nomenclature (ICBN). Vienna code.
4. Morphology: a detailed account of various, orphological characters root, stem, leaf, inflorescence, flower, placentation and fruit types.
5. Diagnostic characters, economic importance and distribution pattern of the following families:
 - i. Ranunculaceae, ii. Brassicaceae (Cruciferae), iii. Fabaceae (Leguminosae)
 - iv. Rosaceae, v. Euphorbiaceae, vii Cucurbitaceae, vii. Solanaceae, viii. Lamiaceae (Labiateae), ix. Apiaceae (Umbelliferae), x. Asteraceae (Compositae), xi. Liliaceae (Sen. Lato), xii. Poaceae (Gramineae)

b) Anatomy

1. Cell wall: structure and chemical composition
2. Concept, structure and function of various tissues like:
 - i. Parenchyma, ii. Collenchyma, iii. Sclerenchyma, iv. Epidermis (including stomata and trichomes), v. Xylem, vi. Phloem
3. Meristem: types, stem and root apices
4. Vascular cambium
5. Structure and development of root, stem and leaf. Primary and secondary growth of dicot stem, periderm
6. Characteristics of wood: diffuse porous and ring -porous, sap and heart wood, soft and hard wood, annual rings.

c) Development / Embryology

Early development of plant body:

1. Capsella bursa-pastoris, 2. Structure and development of Anther Microsporogenesis Microgametophyte, 3. Structure of Ovule Megasporogenesis, Megagametophyte, 4. Endosperm formation 5. Parthenocarpy, 6. Polyembryony