

**BOARD OF STUDIES IN B.Sc BOTANY
2021-2022**

**DEPARTMENT OF BOTANY, MICROBIOLOGY
AND HORTICULTURE**

SYLLABUS FOR B.Sc BOTANY



PITHAPUR RAJAH'S GOVERNMENT COLLEGE

Autonomous and Accredited with 'A' Grade by NAAC (3.17 CGPA)
KAKINADA – 533 001, E G Dist., ANDHRA PRADESH

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
II B.Sc., -Botany-III/ III Semester End (W.E.F. 2021-22)
PLANT TAXONOMY AND EMBRYOLOGY (COURSE: BO3207)

Total hours of Teaching 60hrs @ 4 hrs/week

Total Credits:03

UNIT – I: INTRODUCTION TO PLANT TAXONOMY (12h)

1. Fundamental components of taxonomy (identification, nomenclature, classification)
2. Taxonomic resources: Herbarium- functions & important herbaria, Botanical gardens.
3. Botanical Nomenclature - Principles and rules of ICBN (ranks and names; principle of priority, binomial system; type method, author citation, valid-publication).

UNIT – II: CLASSIFICATION (12h)

1. Systems of classification- Artificial, Natural and Phylogenetic.
2. Bentham & Hooker's system of classification- merits and demerits.
3. APG – IV System of Classification.
4. Phylogeny

UNIT –III: SYSTEMATIC TAXONOMY-I (12h)

Systematic study and economic importance of the following families: Annonaceae, Capparidaceae, Rutaceae, Curcubitaceae, and Apiaceae.

UNIT –IV: SYSTEMATIC TAXONOMY-II (12h)

Systematic study and economic importance of plants belonging to the following families: Asteraceae, Asclepiadaceae, Lamiaceae, Ephorbiaceae, orchidaceae and Poaceae.

UNIT – V: EMBRYOLOGY (12h)

1. Anther structure, microsporogenesis and development of male gametophyte.
2. Ovule structure and types; Megasporogenesis, development of Monosporic, Bisporic and Tetrasporic types (*Peperomia*, *Drusa*, *Adoxa*) of embryo sacs.
3. Pollination and Fertilization (outlines) Endosperm development and types.
4. Development of Dicot . Polyembryony,
5. Pollen & Pistil interaction., Apomixis

Books for Reference:

- Porter, C.L.: Taxonomy of flowering Plants, Eurasia Publishing House, New Delhi.
- Lawrence, G.H.M. (1953): Taxonomy of Vascular Plants, Oxford & IBH Publishers, New Delhi, Calcutta.
- Jefferey, C. (1968): An Introduction to Plant Taxonomy J.A. Churchill, London.
- Mathur, R.C. (1970): Systematic Botany (Angiosperms) Agra Book Stores – Lucknow, Ajmer, Allahabad, Delhi.
- Maheswari, P (1963): Recent Advances in the Embryology of Angiosperms (Ed.,)
- International Society of Plant Morphologists – University of Delhi.
- Swamy. B.G.L. & Krishnamoorthy. K.V. (1980) : From flower to fruit Tata McGraw Hill Publishing Co., Ltd., New Delhi.
- Maheswari, P. (1985): An Introduction to the Embryology of Angiosperms Tata McGraw Hill Publishing Co., Ltd., New Delhi.
- Bhojwani, S.S. & Bhatnagar, S.P. (2000): The Embryology of Angiosperms (4th Edition) Vikas Publishing House (P) Ltd., UBS Publisher's Distributors, New Delhi.

Suggested activity: Collection of locally available plants of medicinal importance, observing pollen grains in honey, Aero palynology-collection of pollen from air using glycerin strips in different seasons.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
II B.Sc., BOTANY PRACTICAL PAPER – III PRACTICAL SYLLABUS
PLANT TAXONOMY AND EMBRYOLOGY

Total hours of laboratory Exercises 30 hrs @ 2 per week

Total credits:02

1. Systematic study of locally available plants belonging to the families prescribed in theory syllabus.
2. Demonstration of herbarium techniques.
3. Structure of pollen grains using whole mounts (*Catharanthus*, *Hibiscus*, *Acacia*, Grass).
4. Demonstration of Pollen viability test using *in-vitro* germination (*Catharanthus*).
5. Study of ovule types and developmental stages of embryo sac using permanent slides /Photographs.
6. Structure of endosperm (nuclear and cellular);
7. Developmental stages of dicot and monocot Embryos using permanent slides/ Photographs
8. Isolation and mounting of embryo (using *Symopsis* / *Senna* / *Crotalaria*)
9. Field visits.
10. Study of local flora and submission of Field Note Book.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
II B.Sc., Botany Practical Examinations at the End of Semester-III
(PLANT TAXONOMY AND EMBRYOLOGY)
Botany Practical Model Paper-III (w.e.f 2021-22)

Time: 2 hours

Max. Marks: 50

1. Describe the given Plant specimens (A & B) in technical terms. Draw neat labeled diagrams of twig with inflorescence, L.S. of Flower, T.s. of Ovary and floral Diagram. Give floral formula. Identify the family

2x10 = 20 Marks

(Description-
vegetative - 2 marks, floral – 4 marks;
diagrams-3 marks, Identification-1 marks)

2. Derive the plant specimens C & D to their respective families-

2x04 = 08 Marks

3. Identification of spotters - D, E, and F (Embryology)

3x04 = 12 Marks

4. Record & Herbarium (submission compulsory)

10 Marks

Total = 50 Marks

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
II Year B.Sc., Degree Examinations at III Semester End
Botany Paper III: PLANT TAXONOMY & EMBRYOLOGY
(Course: BO3207 Model Paper w.e.f. 2021-22)

Time: 2½ Hrs.

Max. Marks: 60

SECTION – A

3×10 =30M

Answer any **THREE** of the following by choosing atleast one question from each Part., draw neat and labeled diagrams wherever necessary

PART - I

1. a) Write an essay on Herbarium
OR
b) Write an Essay On Fundamental Concepts of taxonomy.
2. a) Explain about Bentham and Hookers classification, merits and demerits
OR
b) Write an Essay on APG-IV system of Classification and also Write Merits and Demerits of this Classification.
3. a) Write a detailed account on Cucurbitaceae family
OR
b) Give a Detailed account on Rutaceae Family.

PART - II

4. a) Write an essay on Asteraceae family
OR
b) Give a Detailed note on Lamiaceae Family.
5. a) Write a detailed note on endosperm types
OR
b) Give a Detailed note on Development of Dicot embryo.

SECTION – B

4×5=20M

Answer any **FOUR** of the following Questions, draw neat and labeled diagrams wherever necessary

1. Binomial System.
2. Natural Classification.
3. Economic importance of Poaceae.
4. Sub families in Asclepiadaceae.
5. Bisporic Embryo sac.

SECTION – C

5×2=10M

Answer **ALL** Questions

1. ICBN
2. Omega classification
3. Ruminant endosperm
4. Lever mechanism
5. Synergids

BLUE PRINT FOR QUESTION SETTER

UNIT NO/TITLE	LAQ	SAQ	VSAQ	Marks allotted to the Module
UNIT –I: INTRODUCTION TO PLANT TAXONOMY	1	1	1	17
UNIT-II: CLASSIFICATION	1	1	1	17
UNIT-III: SYSTEMATIC TAXONOMY-I	1	1	1	17
UNIT-IV: SYSTEMATIC TAXONOMY-II	1	1	1	17
UNIT-V : EMBRYOLOGY	1	1	1	17
Total marks allotted to all question including choice				85

Note: Question paper setters are requested to adhere strictly to the above blue print while preparing the said paper

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
II B.Sc-Botany-III/ III Semester End (W.E.F. 2021-22)
PLANT TAXONOMY AND EMBRYOLOGY
II B.Sc-Botany-III/ III Semester Question Bank

UNIT – I: INTRODUCTION TO PLANT TAXONOMY

Essay Questions.

1. Write an Essay On Fundamental Concepts of taxonomy.
2. Give a Detailed account on Herbarium.
3. write an Essay on ICBN.

Short notes

1. Botanical Gardens
2. Binomial System.

Very Short notes

1. Taxonomy
2. Nomenclature
3. BSI
4. RBG
5. MBG
6. ICBN
7. Isotype
8. Neotype
9. Binomial system

UNIT – II: CLASSIFICATION

Essay Questions.

1. Give a Detailed account on Bentham -Hooker Classification and also write Merits and Demerits of this classification
2. Write an Essay on APG-IV system of Classification and also Write Merits and Demerits of this Classification.

Short notes.

1. Artificial Classification.
2. Natural Classification.
3. Phylogenetic Classification.

Very Short notes

1. Artificial classification
2. Natural classification
3. Phylogenetics classification
4. Omega classification
5. Alpha classification
6. Genus
7. Species
8. Dicotyledon
9. Mono cotyledon

UNIT –III: SYSTEMATIC TAXONOMY-I

Essay Questions.

1. Give a Detailed account on Rutaceae Family.
2. Write an Essay on Cucurbitaceae Family.
3. Give a detailed note on Apiaceae Family.

Short notes.

1. Floral characters of Annonaceae.
2. Economic importance of Poaceae.
3. Economic Importance of Annonaceae.

Very Short notes

1. Cauliflory
2. Spirocyclic
3. Ruminant endosperm
4. Androphore
5. Parietal placentation
6. Obdiplostemonous
7. Rhu-oil
8. Gynoecium on cucurbits
9. Momordica charantia
10. Stylopodium

UNIT –IV: SYSTEMATIC TAXONOMY-II

Essay Questions.

1. Write an Essay on Composite Family.
2. Give a Detailed note on Lamiaceae Family.
3. Write an Essay on Euphorbiaceae Family.

Short notes.

1. Economic importance of Asteraceae.
2. Sub families in Asclepiadaceae.
3. Economic importance of Aracaceae

Very Short notes

1. Syngenesious anthers
2. Pappus
3. Cichory
4. Corollary corona
5. Gynostegium
6. Pollinium
7. Hemidesmus indicus
8. Gynobasic style
9. Lever mechanism
10. Cyathium
11. Para rubber
12. Resupination
13. Lodicules
14. Caryopsis
15. Khu-soil

UNIT – V: EMBRYOLOGY

Essay Questions.

1. Describe the types of tetrasporic embryo sacs.
2. Give a Detailed note on types of Endosperms.
3. Give a Detailed note on Development of Dicot embryo.

Short notes

1. Ovule types.
2. Apomixis.
3. Bisporic Embryo sac.
4. Polyembryony
5. Pollen-pistil Interaction

Very Short notes

1. Microsporogenesis
2. Tapetum
3. Endothelium
4. Polygonum
5. Synergids
6. X - bodies
7. Allium type
8. Double fertilization
9. Chalazogamy
10. Circinotropus ovule
11. Helobial endosperm
12. Poly embryony
13. Apomixis