

BOARD OF STUDIES IN B.Sc BOTANY

2022-2023

DEPARTMENT OF BOTANY

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
I B.Sc., -Botany-II/ II Semester End (W.E.F. 2022-23)

BASICS OF VASCULAR PLANTS AND PHYTOGEOGRAPHY (COURSE: BO2207)

Total hours of Teaching 60hrs @ 4 hrs/week

Total Credits:02

UNIT – I: PTERIDOPHYTES

12 Hrs.

1. General characteristics of Pteridophyta; classification of Smith (1955) up to divisions.
2. Occurrence, morphology, anatomy, reproduction and life history of (a) Lycopodium (Lycopsida) and (b) Marsilea (Filicopsida).
3. Stelar evolution in Pteridophytes;
4. Heterospory and seed habit.

UNIT – II: GYMNOSPERMS

14 Hrs.

1. General characteristics of Gymnosperms; Sporne classification upto classes.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) Pinus (Coniferopsida) and (b) Gnetum (Gnetopsida).
3. Outlines of geological time scale.
4. A brief account on Cycadeoidea.

UNIT – III: BASIC ASPECTS OF TAXONOMY

13 Hrs.

1. Aim and scope of taxonomy; Species concept: Taxonomic hierarchy, species, genus and family. Taxonomiic Keys.
2. Plant nomenclature: Binomial system, ICBN- rules for nomenclature.
3. Herbarium and its techniques, BSI herbarium and Kew herbarium; concept of digital herbaria.
4. Bentham and Hooker system of classification
5. Systematic description and economic importance of the following families:
(a) Annonaceae (b) Curcubitaceae

UNIT – IV: SYSTEMATIC TAXONOMY

13 Hrs.

1. Systematic description and economic importance of the following families:
(a) Asteraceae (b) Asclepiadaceae (c) Apocynaceae (d) Euphorbiaceae
(e) Arecaceae and (f) Poaceae g) Orchidaceae
2. Outlines of Angiosperm Phylogeny Group (APG IV).

UNIT – V: PHYTOGEOGRAPHY

08 Hrs.

1. Principles of Phytogeography, Distribution (wides, endemic, discontinuous species)
2. Endemism – types and causes.
3. Phytogeographic regions of India.
4. Vegetation types in Andhra Pradesh.

TEXT BOOKS:

- Botany – I (Vrukshasastram-I): Telugu Akademi, Hyderabad
- Botany – II (Vrukshasastram-II): Telugu Akademi, Hyderabad
- Acharya, B.C., (2019) Archchegoniates, Kalyani Publishers, New Delhi
- Bhattacharya, K., G. Hait & Ghosh, A. K., (2011) A Text Book of Botany, Volume-II, New Central Book Agency Pvt. Ltd., Kolkata
- Hait, G., K. Bhattacharya & A. K. Ghosh (2011) A Text Book of Botany, Volume-I, New Central Book Agency Pvt. Ltd., Kolkata
- Pandey, B.P. (2013) College Botany, Volume-I, S. Chand Publishing, New Delhi
- Pandey, B.P. (2013) College Botany, Volume-II, S. Chand Publishing, New Delhi

BOOKS FOR REFERENCE:

- Smith, G.M. (1971) Cryptogamic Botany Vol. II., Tata McGraw Hill, New Delhi
- Sharma, O.P. (2012) Pteridophyta. Tata McGraw-Hill, New Delhi
- Kramer, K.U. & P. S. Green (1990) The Families and Genera of Vascular Plants, Volume –I: Pteridophytes and Gymnosperms (Ed. K. Kubitzki) Springer-Verlag, New York
- Bhatnagar, S.P. & Alok Moitra (1996) Gymnosperms. New Age International, New Delhi
- Coulter, J.M. & C.J. Chamberlain (1910) Morphology of Gymnosperms, The University of Chicago Press, Chicago, Illinois
- Govil, C.M. (2007) Gymnosperms: Extinct and Extant. KRISHNA Prakashan Media (P) Ltd. Meerut & Delhi
- Sporne, K.R. (1971) The Morphology of Gymnosperms. Hutchinsons Co. Ltd., London
- Arnold, C.A., (1947) An introduction to Paleobotany McGraw – Hill Book Company, INC, New York
- Stewart, W.N., and G.W. Rothwell (2005) Paleobotany and the evolution of plants Cambridge University Press, New York
- Lawrence, George H.M. (1951) Taxonomy of Vascular Plants. The McMillan Co., New York
- Heywood, V. H. and D. M. Moore (1984) Current Concepts in Plant Taxonomy. Academic Press, London.
- Jeffrey, C. (1982) An Introduction to Plant Taxonomy. Cambridge University Press, Cambridge. London.
- Sambamurty, A.V.S.S. (2005) Taxonomy of Angiosperms I. K. International Pvt. Ltd., New Delhi
- Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi.
- Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.
- Cain, S.A. (1944) Foundations of Plant Geography Harper & Brothers, N.Y.
- Good, R. (1997) The Geography of flowering Plants (2nd Edn.) Longmans, Green & Co., Inc., London & Allied Science Publishers, New Delhi
- Mani, M.S (1974) Ecology & Biogeography of India Dr. W. Junk Publishers, The Hague

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

I B.Sc., BOTANY PRACTICAL PAPER – II PRACTICAL SYLLABUS

BASICS OF VASCULAR PLANTS AND PHYTOGEOGRAPHY

Total hours of laboratory Exercises 30 hrs @ 2 per week

Total credits:02

PRACTICAL SYLLABUS:

1. Study/ microscopic observation of vegetative, sectional/anatomical and reproductive structures of the following using temporary or permanent slides/ specimens/ mounts:
 - a. Pteridophyta: Lycopodium and Marselia
 - b. Gymnosperms: Pinus and Gnetum
2. Study of fossil specimens of Cycadeoidea and Pentoxylon (photographs /diagrams can be shown if specimens are not available).
3. Demonstration of herbarium techniques.
4. Systematic / taxonomic study of locally available plants belonging to the families prescribed in theory syllabus. (Submission of 30 number of Herbarium sheets of wild plants with the standard system is mandatory).
5. Mapping of phytogeographical regions of the globe and India.
6. Mapping of Phytogeographical regions of Andhra Pradesh
7. Permanent slide preparation.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
I B.Sc., Botany Practical Examinations at the End of Semester-II
BASICS OF VASCULAR PLANTS AND PHYTOGEOGRAPHY
Botany Practical Model Paper-I (w.e.f 2022-23)

Time: 2 hours

Max. Marks: 50

1. Analyze T.S. of the material 'A' (Pteridophyta), make a temporary slide and justify the identification with apt points. 10 M
2. Analyze T.S. of the material 'B' (Gymnosperms), make a temporary slide and justify the identification with apt points. 10 M
3. Describe the vegetative and floral characters of the material 'C' (Taxonomy of Angiosperms) and derive its systematic position. 10 M
4. Identify the specimen 'D' (Fossil Gymnosperm) and give specific reasons. 05 M
5. Locate the specified phytogeographical regions (2x2M) in the world / India (E) map supplied to you. 04 M
6. Record + Herbarium & Field note book + Viva-voce 5 + 4 + 3 = 12 M

Suggested co-curricular activities for Botany Core Course-2 in Semester-II:

A. Measurable:

a. Student seminars:

1. Fossil Pteridophytes.
2. Aquatic ferns and tree ferns
3. Ecological and economic importance of Pteridophytes
4. Evolution of male and female gametophytes in Gymnosperms.
5. Endemic and endangered Gymnosperms.
6. Ecological and economic importance of Gymnosperms.
7. Floras and their importance: Flora of British India and Flora of Madras Presidency.
8. Botanical gardens and their importance: National Botanic garden and Royal Botanic garden.
9. Artificial, Natural and Phylogenetic classification systems.
10. Molecular markers used in APG system of classification.
11. Vessel less angiosperms.
12. Insectivorous plants.
13. Parasitic angiosperms.
14. Continental drift theory and species isolation.

b. Student Study Projects:

1. Collection and identification of Pteridophytes from their native locality/ making an album by collecting photographs of Pteridophytes.
2. Collection and identification of Gymnosperms from their native locality/ making an album by collecting photographs of Gymnosperms.
3. Collection of information on famous herbaria in the world and preparation of a report.
4. Collection of information on famous botanic gardens in the world and preparation of a report.
5. Collection of data on vegetables (leafy and fruity) plants in the market and preparation of a report on their taxonomy.
6. Collection and identification of fresh and dry fruits plants in the market and preparation of a report on their taxonomy.

7. Collection of data on plants of ethnic and ethnobotanical importance from Their native locality.

8. Preparation of a local flora by enlisting the plants of their native place.

- a. **Assignments:** Written assignment at home / during '0' hour at college; preparation of charts with drawings, making models etc., on topics included in syllabus.

B. General:

1. Visit to Botanic garden in a Research institute/University to see the live plants.
2. Virtual tour in websites for digital herbaria and botanic gardens.
3. Acquaint with standard floras like – Flora of Madras Presidency, Flora of their respective district in Andhra Pradesh.
4. Looking into vegetation of different phytogeographical regions using web resources.
5. Group Discussion (GD)/ Quiz/ Just A Minute (JAM) on different modules in syllabus of the course.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
I Year B.Sc., Degree Examinations at II Semester End
Botany Paper II: BASICS OF VASCULAR PLANTS AND PHYTOGEOGRAPHY OF
PLANTS

(Course: BO2207 Model Paper w.e.f. 2022-23)

Time: 2Hrs.

Max. Marks: 50

SECTION – A

3 × 10 = 30 M

Answer any **THREE** of the following by choosing atleast one question from each Part.

PART - I

1. a) Give a brief account on stellar evolution in Pteridophytes
OR
b) Describe the reproduction in Marselia
2. a) Describe the reproduction in Pinus
OR
b) General characters of Gymnosperms
3. a) General account on Bentham & Hooker classification
OR
b) Give a note on systematic description of Cucurbitaceae

PART - II

4. a) Give a detailed account of Euphorbiaceae
OR
b) Give a systematic description of Asclepiadaceae
5. a) Illustrate phytogeography regions in India
OR
b) Give an account on Endemism
6. a) Give a detailed note on Rules of ICBN
OR
b) write about herbarium preparation & its significance.

SECTION – B

4 × 5 = 20 M

Answer any **FOUR** of the following Questions

1. Marsilea Petiole
2. Seed habit
3. General characters of Gymnosperms
4. Economic importance of Poaceae
5. Floral Characters of Cucurbitaceae
6. Gnetum male cone

BLUE PRINT FOR QUESTION SETTER

UNIT NO / TITLE	LAQ	SAQ	Marks allotted to the Module
UNIT – I: PTERIDOPHYTES	2	1	25
UNIT – II: GYMNOSPERMS	2	1	25
UNIT – III: BASIC ASPECTS OF TAXONOMY	4	2	50
UNIT – IV: SYSTEMATIC TAXONOMY	2	1	25
UNIT – V: PHYTOGEOGRAPHY	2	1	25
Total marks allotted to all questions including choice			150

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
I B.Sc-Botany-II/ II Semester End (W.E.F. 2022-23)
Botany Paper II: BASICS OF VASCULAR PLANTS AND PHYTOGEOGRAPHY
I B.Sc-Botany-II/ II Semester Question Bank

UNIT – I: PTERIDOPHYTES

Essay Questions

1. Explain stelar evolution in Pteridophytes.
2. Explain Marselia reproduction .
3. Explain Lycopodium sexual reproduction

Short Answer Questions

1. Lycopodium stem anatomy.
2. Marsilea Rhizome.
3. Seed habit
4. Marsilea petiole
5. Heterospory

UNIT – II: GYMNOSPERMS

Essay Questions

1. General characters of Gymnosperms
2. Describe the reproduction in Pinus
3. Describe the reproduction in Gnetum

Short Answer Questions

1. Pinus male cone.
2. Pinus female cone
3. L.S of Pinus Ovule.
4. Gnetum male cone
5. Gnetum ovule.

UNIT – III: BASIC ASPECTS OF TAXONOMY

Essay Questions

1. Explain the Bentham & Hooker Classification
2. Explain systematic description of Cucurbitaceae
3. Explain Herbarium Preparation & its Significance
4. Give a detailed note on rules of ICBN

Short Answer Questions

1. Floral characters of Annonaceae
2. Outlines of APG-IV
3. Typification
4. Binomial System

UNIT – IV: SYSTEMATIC TAXONOMY

Essay Questions

1. systematic description of Apocynaceae
2. systematic description of Euphorbiaceae
3. systematic description of Asclepiadaceae

Short Answer Questions

1. Economic importance of Asteraceae.
2. Floral characters of Poaceae
3. Economic importance of Aracaceae
4. Subfamilies in Asclepiadaceae

UNIT – V: PHYTOGEOGRAPHY

Essay Questions

1. Explain about Phytogeographic regions in World
2. Explain about Phytogeographic regions in India
3. Explain about Endemism

Short Answer Questions

1. Vegetation types in AP
2. Phytogeography distribution