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
I B.Sc., -Botany-II/ II Semester End (W.E.F. 2021-22)
BASICS OF VASCULAR PLANTS AND PHYTOGEOGRAPHY (COURSE: BO2207)
Total hours of Teaching 60hrs @ 4 hrs/week Total Credits:03

UNIT – I: PTERIDOPHYTES 12 Hrs.

1. General characteristics of Pteridophyta; classification of Smith (1955)uptodivisions.
2. Occurrence, morphology,anatomy, reproduction (developmental details are notneeded) and life historyof (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; Sporneclassification uptoclasses.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) Cycas(Cycadopsida) and (b) Gnetum (Gnetopsida).
3. Outlines of geological time scale.
4. A brief account on Cycadeoidea.

UNIT – III:BASIC ASPECTS OF TAXONOMY 13Hrs.

1. Aim and scope of taxonomy; Species concept: Taxonomic hierarchy, species, genus and family.
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) Curcurbitaceae

UNIT – IV: SYSTEMATIC TAXONOMY 13 Hrs.

1. Systematic description and economic importance of the following families:
   (a) Asteraceae (b) Asclepiadaceae (c)Amaranthaceae(d) Euphorbiaceae
   (e) Arecaceaeand (f) Poaceae
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 World.
4. Phytogeographic regions of India.
5. 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)CryptogamicBotanyVol. 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) Springe-Verlag, New York
- Bhatnagar, S.P. &AlokMoitra (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 PaleobotanyMcGraw –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., NewDelhi.
- Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA,U.S.A.
- Cain, S.A . (1944)Foundations of Plant GeographyHarper & 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 IndiaDr. W. Junk Publishers, TheHaque

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: Cycasand 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 / taxonomicstudy 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.

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 2021-22)

Time: 2 hours **Max. Marks: 50**

1. Take T.S. of the material 'A' (Pteridophyta), make a temporary slide and justify the identification with apt points. 10 M
2. Take 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/ makingan album by collecting photographs of Pteridophytes.
2. Collection and identification of Gymnospermsfrom 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 fromTheirnative locality.
8. Preparation of a local flora by enlisting the plants of their native place.

c. 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 PLANTS
(Course: BO2207 Model Paper w.e.f. 2021-22)

Time: $2_{1/2}$ Hrs. **Max. Marks: 60**

SECTION – A **3 × 10 = 30 M**

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

PART - I

1. a) Stelar Evolution in Pteridophytes
   OR
   b) Marselia Life cycle.
2. a) Sexual Reproduction in Cycas
   OR
   b) General Characters of Gymnosperms
3. a) Write about Bentham&Hooker Classification
   OR
4. b) Systematic Description of Cucurbitaceae

PART - II

5. a) Explain detailed account of Euphorbiaceae
   OR
   b) Systematic Description of Asclepiadaceae
6. a) Write about Phytogeographic regions in India
   OR
   b) Endemism

SECTION – B **4 × 5 = 20 M**

Answer any **FOUR** of the following Questions

1. Marsilea Petiole
2. General Characters of Gymnosperms
3. Economic importance of Poaceae
4. Floral Characters of Cucurbitaceae
5. Endemism

SECTION – C **5 × 2 = 10 M**

Answer **ALL** Questions.

1. Heterospory
2. Pavement tissue
3. Binomial Nomenclature
4. Synandrous
5. Any Four Endemic Sps in Andhra Pradesh

BLUE PRINT FOR QUESTION SETTER

UNIT NO / TITLE	SAQ	LAQ	VSAQ	Marks allotted to the Module
UNIT – I: PTERIDOPHYTES	2	1	1	17
UNIT – II: GYMNOSPERMS	2	1	1	17
UNIT – III: BASIC ASPECTS OF TAXONOMY	2	1	1	17
UNIT – IV: SYSTEMATIC TAXONOMY	2	1	1	17
UNIT – V: PHYTOGEOGRAPHY	2	1	1	17
Total marks allotted to all questions 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
I B.Sc-Botany-II/ II Semester End (W.E.F. 2021-2)
Botany Paper II: BASICS OF VASCULAR PLANTS AND PHYTOGEOGRAPHY
I B.Sc-Botany-II/ II Semester Question Bank

UNIT – I: PTERIDOPHYTES

Essay Questions

1. Stelar Evolution in Pteridophytes.
2. Marselia Life cycle.
3. Lycopodium Sexual Reproduction

Short Answer Questions

1. Lycopodium stem anatomy.
2. Marsilea Rhizome.
3. Marsilea Sporocarp
4. Marsilea petiole
5. Asexual reproduction in Lycopodium

Very short answer questions

1. Vascular cryptogams
2. Alternation of generations
3. Urostachya
4. Rhopalostachya
5. Lycopodium sporangium
6. Indusium
7. Plectostele
8. Actenostele
9. Amphiphloic syphanostele
10. Heterospory
11. Circinate vernation

UNIT – II: GYMNOSPERMS

Essay Questions

1. General Characters of Gymnosperms
2. Reproduction in Cycas
3. Reproduction in Pnetum

Short Answer Questions

1. Cycas male cone.
2. Cycas female cone
3. Cycus Ovule.
4. Gnetum male cone
5. Gnetum ovule.

Very short answer questions

1. Haplocheilic stomata
2. syndetocheilic stomata
3. Mycorrhizal roots
4. Transfusion tissue
5. Manoxylic wood

6. Pycnozylic wood
7. Cycas corolloid roots
8. Gnetum seed
9. Winged pollen grains
10. Mesozoic era
11. Bennettitales

UNIT – III: BASIC ASPECTS OF TAXONOMY

Essay Questions

1. Bentham&Hooker Classification
2. Systematic Description of Cucurbitaceae
3. Herbarium Preparation & its Significance

Short Answer Questions

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

Very short answer questions

1. Artificial Classification
2. ICBN
3. Binomial system
4. Digital Herbarium
5. Holotype
6. Paratype
7. Tautonym
8. Polypetalae
9. Gamopetalae
10. Monochlamydeae
11. Ruminate Endosperm
12. Ylong- Ylong oil
13. Synandrous stamens
14. Bi- collateral vascular bundles

UNIT – IV: SYSTEMATIC TAXONOMY

Essay Questions

1. Systematic Description of Amaranthaceae
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

Very short answer questions

1. Syngenecious stamens
2. Chicory

3. Gynostegium
4. Staminal corona
5. Translator mechanism
6. Caruncle
7. Para rubber
8. Regma
9. Economic importance of Annonaceae
10. Scutellum
11. Ladicules
12. Bulliform cells

UNIT – V: PHYTOGEOGRAPHY

Essay Questions

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

Short Answer Questions

1. Vegetation types in AP
2. Phytogeography distribution

Very short answer questions

1. Endemic species
2. Discontinuous species
3. Extinct Species
4. Neo- Endemism
5. Paleo- Endemism
6. Western Himalayas
7. Sundarbans
8. Eastern Himalayas
9. Coringa Mangrove forests
10. Eastern Ghats
11. Deccan plateau