

BOT-160
GOVERNMENT COLLEGE (AUTONOMOUS), RAJAMAHENDRAVARAM
I B.Sc., – Botany Core Course-2 / II Semester (W.E.F. 2020-2021)
Basics of Vascular plants and Phytogeography
(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)
Total Hrs. of Teaching-Learning: 60 @ 4 h / Week **Total Credits : 03**

Unit – 1: Pteridophytes

12 Hrs.

1. General characteristics of Pteridophyta; classification of Smith (1955) up to divisions.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) *Lycopodium* (Lycopsida) and (b) *Marsilea* (Filicopsida).
3. Stellar evolution in Pteridophytes;
4. Heterospory and seed habit

Unit – 2: 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) *Cycas* (Cycadopsida) and (b) *Gnetum* (Gnetopsida).
3. Outlines of geological time scale.
4. A brief account on Cycadeoidea.

Unit – 3: 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) Curcubitaceae

Unit – 4: Systematic Taxonomy

13 Hrs.

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

Unit – 5: 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) Archhegoniates, 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

Learning Outcomes: On successful completion of this course, the students will be able to:

- Classify and compare Pteridophytes and Gymnosperms based on their morphology, anatomy, reproduction and life cycles.
- Justify evolutionary trends in tracheophytes to adapt for land habitat. Explain the process of fossilization and compare the characteristics of extinct and extant plants.
- Critically understand various taxonomical aids for identification of Angiosperms. Analyze the morphology of the most common Angiosperm plants of their localities and recognize their families.
- Evaluate the ecological, ethnic and economic value of different tracheophytes and summarize their goods and services for human welfare.
- Locate different phytogeographical regions of the world and India and can analyze, their floristic wealth.

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GOVERNMENT COLLEGE (AUTONOMOUS), RAJAMAHENDRAVARAM

I B.Sc., – Practical syllabus of Botany Core Course – 2/ Semester – II

Basics of Vascular plants and Phytogeography

(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)

(Total hours of laboratory exercises 30 Hrs. @ 02 Hrs. /Week)

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 : *Cycas* 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.