ST. JOSEPH’S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM

III SEMESTER   **BOTANY** TIME:3HRS/WEEK

B-Ma1-3101(3) **VASCULAR PLANTS**  MARKS:100

w.e.f 2024-2025 (23AK Batch) **Pteridophytes, Gymnosperms and Taxonomy of Angiosperms**  **SYLLABUS**

**I. OBJECTIVES:** By the end of this course the learner has:

1. To recognize the morphology, anatomy and reproduction in two groups of archegoniates.

2. To acquire knowledge of the taxonomic aids and classification systems.

3. To read the vegetative and floral characteristics of some forms of angiospermic families along with their economic value.

4. To study the significance of other branches of botany in relation to plant taxonomy.

**II. COURSE OUTCOMES: On completion of this course students will be able to:**

CO1. Infer the evolution of vasculature, heterospory and seed habit in Pteridophytes.

CO2. Illustrate the general characteristics of Gymnosperms along with their uses

CO3. Discuss about some Taxonomic aids and their applications in plant systematics.

CO4. Compare and contrast the vegetative and floral characteristics of some angiospermic families

CO5. Evaluate the economic value of plant species from the families under the study.

CO6. Defend the utility of evidences from different branches of botany in solving the taxonomic lineages of some species.

**UNIT-I: PTERIDOPHYTES: 10HRS.**

1. General characteristics of Pteridophyta; Smith (1955) classification.

2. Occurrence, morphology,anatomy, reproduction (developmental details are notneeded)

and life history of: (a) Lycopsida:*Lycopodium* and (b) Filicopsida: *Marsilea*

3. Stelar evolution in Pteridophytes; Heterospory and seed habit.

4. Ecological and economic importance of Pteridophytes.

**UNIT-II: GYMNOSPERMS 10Hrs.**

1. General characteristics of Gymnosperms; Sporne (1965) classification.

2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed)

and life history of:(a) Cycadopsida: *Cycas* and (b) Gnetopsida: *Gnetum*

3. Ecological and economic importance of Gymnosperms.

**UNIT-3: PRINCIPLES OF PLANT TAXONOMY 10 Hrs.**

1. Aim and scope of taxonomy, species concept, taxonomic hierarchy-major and minor

categories.

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. Phylogenetic systematics: primitive and advanced, homology and analogy, parallelism and convergence, monophyly, paraphyly, polyphyly, clades. synapomorphy, symplesiomorphy, apomorphy. APG-IV classification.

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**UNIT- 4: DESCRIPTIVE PLANT TAXONOMY 8 HRS.**

Systematic description and economic importance of the following families:

1. Polypetalae: (a) Annonaceae (b) Curcurbitaceae

2. Gamopetalae: (a) Asteraceae (b) Asclepiadaceae

3. Monochlamydae: (a) Amaranthaceae (b) Euphorbiaceae

4. Monocotyledonae: (a) Arecaceae (b) Poaceae

**UNIT- 5: EVIDENCES FOR PLANT SYSTEMATICS 7HRS.**

1. Anatomy and embryology in relation to plant systematics.

2. Cytology and cytogenetics in relation to plant systematics.

3. Phytochemistry in relation to plant systematics.

4. Numerical taxonomy

5. Origin and evolution of angiosperms.

**IV. Text Books:**

1. Acharya, B.C., (2019) Archchegoniates, Kalyani Publishers, New Delhi

2. Bhattacharya, K., G. Hait&Ghosh, A. K., (2011) A Text Book of Botany, VolumeII, New Central Book Agency Pvt. Ltd., Kolkata

3. Hait,G., K.Bhattacharya&A.K.Ghosh (2011) A Text Book of Botany, Volume-I,

New Central Book Agency Pvt. Ltd., Kolkata

4. Pandey, B.P. (2013) College Botany, Volumes-I&II, S. Chand Publishing, New Delhi

**V. Reference Books:**

1. Smith, G.M. (1971) CryptogamicBotanyVol. II., Tata McGraw Hill, New Delhi

2. Sharma,O.P.(2012) Pteridophyta. Tata McGraw-Hill, New Delhi

3. Sporne, K.R. (1971) The Morphology of Gymnosperms.Hutchinsons Co. Ltd.,London

4. Coulter, J.M. & C.J.Chamberlain(1910) Morphology of Gymnosperms,The University of Chicago Press, Chicago, Illinois

5. Bhatnagar, S.P. &AlokMoitra (1996) Gymnosperms. New Age International, NewDelhi

6. Sambamurty, A.V.S.S. (2005) Taxonomy of Angiosperms I. K .InternationalPvt. Ltd., New Delhi

7. Singh, G. (2012). Plant Systematics: Theory and Practice.Oxford& IBH Pvt.Ltd., NewDelhi.

8. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA,U.S.A.

**VI. Suggested activities and evaluation methods:**

**Unit-1: Activity:** Making temporary slides/models/drawings of Pteridophytes in the syllabus.

**Evaluation method:** Assessment of the temporary slides/model/drawing.

**Unit-2: Activity:** Study of wood elements in locally available Gymnosperms and making temporary slides.

**Evaluation method:** Validation of prepared slides submitted by the learner.

**Unit-3: Activity:** Botanical field trip and collecting plant specimens for herbarium.

**Evaluation method:** Attendance in field trip and submission of field note book and herbarium sheets with filled in labels.

**Unit-4: Activity:** Making good models or drawings or collection of photographs of some important plant species from the families included in the syllabus.

**Evaluation method:** Authorize the quality of the work and conferring reward.

**Unit-5: Activity:** Collection of scientific literature on solving taxonomic problems by taking evidences from other branches of Botany.

**Evaluation method:** Validation of the collection submitted along with summary.