



# SRI VENKATESWARA UNIVERSITY, TIRUPATHI

## 4-Year UG Honours in B.Sc.BOTANY: Major in Consonance with Curriculum Frame work w.e.f AY 2025-26

### II Semester

#### COURSES TRUCTURE

#### SEMESTER-II

| Year | Semester | Course | Title                                           | No.Hrs./ Week | No. of Credits |
|------|----------|--------|-------------------------------------------------|---------------|----------------|
| I    | II       | 1      | Diversity of Archegoniates                      | 3             | 3              |
|      |          |        | Diversity of Archegoniates-Practical            | 2             | 1              |
|      |          | 2      | Anatomy and Embryology of Angiosperms           | 3             | 3              |
|      |          |        | Anatomy and Embryology of Angiosperms-Practical | 2             | 1              |

#### Signatures of the Board of Studies members

| Sl No. | Designation  | Name                                                                               | Signature |
|--------|--------------|------------------------------------------------------------------------------------|-----------|
| 1      | BOS Chairman | Dr Mohano Behera, Department of Botany, Govt. Degree College, Pakala               |           |
| 2      | Member       | Dr L. Md. Bakshu, Department of Botany, Dr YSR Govt. Degree College, Veduru Kuppam |           |
| 3      | Member       | Dr M. Hemalatha, Department of Botany, SVCR Govt. Degree College, Palamaner        |           |
| 4      | Member       | Dr A. Sasikala, Department of Botany, SVCR Govt. Degree College, Palamaner         |           |
| 5      | Member       | Smt. S. Padmavathi, Department of Botany, Govt. Degree College, Puttur             |           |
| 6      | Member       | Dr P. Sujana, Department of Botany, Govt. Degree College, Puttur                   |           |

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COURSE3: DIVERSITY OF ARCHEGONIATES

Theory

Credits: 3

3 hrs/week

**I. Learning Objectives:** By the end of this course the learner has to:

1. Explain the general characters, classification and significance of Bryophytes.
2. Discuss the morphological, anatomical and reproductive characters of Pteridophytes.
3. Acquire knowledge of evolutionary trends in Pteridophytes and their value.
4. Brief the morphological, anatomical and reproductive characters of Gymnosperms.
5. Summarize the evolutionary trends in Gymnosperms.

**II. Course Outcomes:** On completion of this course students will be able to:

1. Compare and contrast the morphological, anatomical and reproductive features of some Bryophytes.
2. Illustrate the morphological, anatomical and reproductive characteristics of some Pteridophytes.
3. Infer the evolution of vasculature, heterospory, and seed habit in Pteridophytes.
4. Compare and contrast the morphological, anatomical and reproductive features of some Gymnosperms.
5. Evaluate the evolutionary trends in Gymnosperms.

**III. Syllabus of Theory:**

**Unit-1: Biology of Bryophytes**

9 Hrs.

1. General characteristics of Bryophytes; Rothmaler (1951) classification.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life cycle of (a) Hepaticopsida: *Marchantia* (b) Anthocerotopsida: *Anthoceros* (c) Bryopsida: *Funaria*
3. General account on the evolution of sporophytes in Bryophyta.

**Unit-2: Biology of Pteridophytes**

10 Hrs.

1. General characteristics of Pteridophyta; Smith (1955) classification.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of: (a) Lycopsida: *Lycopodium* (b) Sphenopsida: *Equisetum* and (c) Filicopsida: *Marsilea*



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#### II Semester

#### Unit-3: Evolutionary trends in Pteridophytes

8 Hrs.

1. Geological time scale; a brief account of *Rhynia*
2. Stellar evolution in Pteridophytes; heterospory and seed habit.
3. Ecological and economic importance of Pteridophytes.

#### Unit-4: Biology of Gymnosperms

10 Hrs.

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* (b) Pinopsida: *Pinus* and (c) Gnetopsida: *Gnetum*

#### Unit-5: Evolutionary trends in Gymnosperms

8 Hrs.

1. A brief account on fossilization processes and types of fossils.
2. A overview of *Cycadeoidea* and *Pentoxylon*
3. A summary of evolutionary trends in Gymnosperms.
4. Ecological and economic importance of Gymnosperms.

#### IV. Text Books:

1. Acharya, B.C., (2019) Archegoniates, Kalyani Publishers, New Delhi
2. Bhattacharya, K., G. Hait & Ghosh, A.K., (2011) A Text Book of Botany, Volume II, 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. Shaw, A.J. & B. Goffinet (2000) Bryophyte Biology. Cambridge University Press, New York.
2. Smith, G.M. (1971) Cryptogamic Botany Vol. II., Tata McGraw Hill, New Delhi
3. Sharma, O.P. (2012) Pteridophyta. Tata McGraw-Hill, New Delhi
4. Sporne, K.R. (1971) The Morphology of Gymnosperms. Hutchinsons Co. Ltd., London
5. Coulter, J.M. & C.J. Chamberlain (1910) Morphology of Gymnosperms, The University of Chicago Press, Chicago, Illinois
6. Bhatnagar, S.P. & Alok Moitra (1996) Gymnosperms. New Age International, New Delhi



**VI Suggested activities and evaluation methods:**

**Unit-1: Activity:** Collection and identification of Bryophytes from their locality.

**Evaluation method:** Assessing the collections made by the student and assigning a grade.

**Unit-2: Activity: Making temporary slides/models/drawings** of Pteridophytes in the syllabus.

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

**Unit-3: Activity:** Group discussion/Quiz/JAM on evolutionary trends in Pteridophytes. **Evaluation method:** Assessing the abilities of a group/ an individual based on the performance.

**Unit-4: Activity:** Study of wood elements in locally available Gymnosperms and making temporary slides.

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

**Unit-5: Activity: Assignment/seminar** on evolutionary trends in Gymnosperms-making comparative account.

**Evaluation method:** Evaluating the quality of assignment written with apt examples/quality of presentation using a rubric.

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**COURSE3: DIVERSITY OF ARCHEGONIATES**

**Practical**

**Credits:1**

**2 hrs/week**

**I. Course Outcomes:** On successful completion of this practical course, student shall be able to:

1. Distinguish the Pteridophytes and Gymnosperms based on their morphological, anatomical and reproductive structures.
2. Make systematic classification of plant species using vegetative and floral characters.
3. Identify angiosperm plant species and make herbarium specimens.

**II. Laboratory/Field exercises:**

1. Study/microscopic observation of vegetative ,sectional/anatomical and reproductive structures of the following using temporary or permanent slides/specimen/ mounts:
  - A. Bryophyta: *Marchantia*, *Anthoceros* and *Funaria*
  - B. Pteridophyta: *Rhynia*, *Lycopodium*, *Equisetum*, and *Marselia*
  - C. Gymnosperms: *Cycadeoidea*, *Pentoxylon*, *Cycas*, *Pinus*, and *Gnetum*
2. Field trip to a Botanic garden or local floristic area/forest.

  
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**II Semester**

**Course 3: Diversity of Archegoniates**

**Suggested Model Paper for Practical Examination**

**Max Time: 3 Hrs**

**Max. Marks: 50**

1. Take the T.S. of the given material 'A' (**Bryophyta**), prepare a temporary mount, and write comments on its identification. 10 M
2. Take the T.S. of the given material 'B' (**Pteridophyta**), prepare a temporary mount, and write comments on its identification. 10 M
3. Take the T.S. of the given material 'C' (**Gymnosperm**), prepare a temporary mount, and write comments on its identification. 10 M
4. Identify the following with specific reasons (Spotters) 3 X 4= 12 M
  - D. Bryophyta
  - E. Pteridophyta
  - F. Gymnosperm
5. Record 5 M
6. Viva-voce 3 M

**-Key;** A: *Marchantia*, *Anthoceros* and *Funaria*

B: *Lycopodium*, *Equisetum*, and *Marsilea*

C: *Cycas*, *Pinus* and *Gnetum*

D: Saprophyte of *Marchantia*, *Anthoceros* and *Funaria*

E. L.S of cone of *Lycopodium* and *Equisetum*, and L.S. of Sporocarp of *Marsilea*.

F: Anatomical and Reproductive structures of *Cycas*, *Pinus* and *Gnetum*

  
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**Model question paper- Semester: II**

**Subject: BOTANY Major**

**Single major program wef: 2025- 26**

**COURSE3: DIVERSITY OF ARCHEGONIATES**

**Max. time: 3 hrs**

**Max. marks: 75**

**Section: A**

**Answer any 5 of the following 10 questions. Each question carries 3 marks  
(2 questions should be given from each unit) 5 QX 3 M = 15 M**

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

**Section: B**

**Answer 5 of the following 10 questions following internal choice. Each question carries 12 marks (2 questions should be given from each unit) 5 QX 12 M = 60 M**

Two questions (a,b) will be given from each unit in the syllabus, providing internal choice (a or b) within each unit. Students must answer a total of five questions, selecting one question from each unit.

11. Questions 11 & 12 from unit 1. One should be answered.
- 12.
13. Question 13 & 14 from unit 2. One should be answered
- 14.
15. Question 15 & 16 from unit 3. One should be answered
- 16.
17. Question 17 & 18 from unit 4. One should be answered
- 18.
19. Question 19 & 20 from unit 5. One should be answered
- 20.

**Note:** Questions should be framed to test the students' understanding, analytical, and creative skills. All questions must be set strictly within the prescribed syllabus framework.



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