

ANDHRA KESARI UNIVERSITY



BOTANY: MINOR

w.e.f 2023-24 AY onwards

COURSE STRUCTURE

Year	Semester	Course	Title	No. Hrs./ Week	No. of Credits
I	II	1	Non-vascular Plants –(T)	3	3
			Non-vascular Plants –(P)	2	1

II Semester

Course 1: Non-Vascular Plants (Algae, Fungi, Lichens and Bryophytes)

Credits -3

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

1. To realize the characteristics and diversity of non-vascular plants.
2. To recognize the ecological and economic value of algae, fungi, lichens and bryophytes.
3. To inquire the habit, habitat, morphological features and life cycles of selected genera of non-vascular plants.

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

1. Compile the general characteristics of algae and their significance in nature.
2. Compare and contrast the characteristics of different groups of algae.
3. Summarise the important features of fungi and their economic value.
4. Distinguish the characteristics of different groups of fungi.
5. Elaborate the features and significance of amphibians of plant kingdom
6. Explain the diversity among non-vascular plants.

III. Syllabus of Theory:

Unit-1: Introduction to Algae

8Hrs.

1. General Characteristics of algae: Occurrence and distribution, cell structure, pigments, flagella and reserve food material.
2. Classification of algae: F.E.Fritsch (1935) and Lee (2008)
3. Thallus organization and life cycles in algae.
4. Ecological and economic importance of algae.

Unit-2: Biology of selected Algae

10Hrs.

1. Occurrence, structure, reproduction and life cycle of:
(a) Chlorophyceae: *Spirogyra* (b) Phaeophyceae: *Ectocarpus*
(c) Xanthophyceae: *Vaucheria* (d) Rhodophyceae: *Polysiphonia*
2. A brief account of Bacillariophyceae
3. Culture and cultivation of *Chlorella*

Unit-3: Introduction to Fungi

8Hrs.

1. General characteristics of fungi and Ainsworth (1973) classification.

2. Thallus organization and nutrition in fungi.
3. Reproduction in fungi (asexual and sexual); Heterothallism and parasexuality.
4. Ecological and economic importance of fungi.

Unit-4: Biology of selected Fungi

10Hrs.

1. Occurrence, structure, reproduction and life cycle of:
(a) Mastigomycotina: *Phytophthora* (b) Zygomycotina: *Rhizopus*
(c) Ascomycotina: *Penicillium* (d) Basidiomycotina: *Puccinia*
2. Occurrence, structure and reproduction of lichens; ecological and economic importance of lichens.

Unit-5: Biology of Bryophytes

9Hrs.

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 evolution of sporophytes in Bryophyta.

IV. Text Books:

1. Pandey, B.P. (2013) College Botany, Volume-I, S. Chand Publishing, New Delhi
2. Hait, G., K. Bhattacharya & A.K. Ghosh (2011) A Text Book of Botany, Volume-I, New Central Book Agency Pvt. Ltd., Kolkata

V. Reference Books:

1. Fritsch, F.E. (1945) The Structure—& Reproduction of Algae (Vol. I & Vol. II) Cambridge University Press Cambridge, U.K.
2. Bold, H.C. & M. J. Wynne (1984) Introduction to the Algae, Prentice-Hall Inc., New Jersey
3. Robert Edward Lee (2008) Phycology. Cambridge University Press, New York
4. Van Den Hoek, C., D.G. Mann & H.M. Jahns (1996) Algae : An Introduction to Phycology. Cambridge University Press, New York.

5. Alexopoulos, C.J., C.W.Mims & M.Blackwell (2007) Introductory Mycology, Wiley& Sons, Inc., New York
6. Mehrotra, R.S.& K. R. Aneja (1990) An Introduction to Mycology. New Age International Publishers, New Delhi.
7. Kevin Kavanagh (2005) Fungi; Biology and Applications John Wiley& Sons, Ltd., West Sussex, England.
8. John Webster & R. W. S. Weber (2007) Introduction to Fungi, Cambridge University Press, New York.
9. Shaw, A.J.& B.Goffinet (2000) Bryophyte Biology .Cambridge University Press, New York.

VI. Suggested activities and evaluation methods:

Unit-1: Activity: Algae specimen collection from any water bodies in their locality, recording the characteristics, identification and classifying them according to Fritsch system.

Evaluation method: Evaluating the presentation or report summarizing findings.

Unit-2: Activity: Microscopic observations and recording distinguishing characters of any six algal forms excluding the genera in the syllabus.

Evaluation method: Conducting a Quiz or an exam/ evaluating the chart or drawings or summarized data on similarities and differences.

Unit-3: Activity: Collection or laboratory culture of fungi and reporting the important features.

Evaluation method: Evaluating the report/conducting JAM/Quiz/Group discussion.

Unit-4: Activity: Microscopic observations and summarizing the salient features of the fungal genera and lichen forms in the syllabus.

Evaluation method: Conducting a Quiz or an exam/ evaluating the chart or drawings or concise data on similarities and differences.

Unit-5: Collection, characterization, identification and classification of any four bryophytes from their native locality or college campus.

Evaluation method: Assessment of observations and documentation accuracy/presentation or report summarizing findings based on a rubric.

Semester II

Course 1: Non-vascular Plants (Algae, Fungi, Lichens, and Bryophytes)

Credits -1

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

1. Identify some algal and fungal species based on the structure of thalli and reproductive organs.
2. Decipher the lichens and Bryophytes based on morphological, anatomical and reproductive features.

II. Laboratory/field exercises:

Study/ microscopic observation of vegetative, sectional/anatomical and reproductive structures of the following using temporary or permanent slides/ specimens/ mounts:

1. **Algae:** *Spirogyra*, *Ectocarpus*, *Vaucheria* and *Polysiphonia*; a centric and a pennate diatom.
2. Demonstration of culture and cultivation of *Chlorella*
3. Identification of some algal products available in local market.
4. **Fungi:** *Phytophthora*, *Rhizopus*, *Penicillium* and *Puccinia*
5. Identification of some fungal products available in the local market.
6. **Lichens:** Crustose, foliose and fruiticose
7. **Bryophyta:** *Marchantia*, *Anthoceros* and *Funaria*.

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT
Single Major Programme from the Year 2023-24 Onwards
Programme-B.Sc. Botany Minor- Question Paper model,
First Year-Semester-2
Course 1 - **Non-Vascular Plants (Algae, Fungi, Lichens and Bryophytes)**

Time: 3 Hours

Total Marks: 75

PART –A

Answer any Five of the following.

Note: Draw labelled diagrams wherever necessary (Paper setter must give two questions from each Unit)

5X5=25 Marks

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

PART –B

Answer any Five of the following.

Note: Draw labelled diagrams wherever necessary Marks (Paper setter must give two questions from each Unit)

5X10=50

- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT
Single Major Programme from the Year 2023-24 Onwards
Programme-B.Sc. Botany Minor-Practical Question Paper model, Semester-2
Course 1 - Non-Vascular Plants (Algae, Fungi, Lichens and Bryophytes)

Practical

Time: 3 Hours

Total Marks: 50

Note: **Answer All questions. Draw well labelled diagrams wherever necessary.**

- I. Identify the algal components (**A, B**) in the given mixture. Draw labelled diagrams, classify, and identify giving important characters [Diagrams – 1; classification – 1; characters – 2] 2 x 3 = 6 M
- II. Prepare T.S. of the diseased material as a temporary mount (**C**). 10 M
Identify the pathogen giving reasons and describe with the help of diagrams.
(Preparation – 4; Identification – 3; Diagram – 1; Description – 1; Classification – 1)
- III. Describe the procedure of Cultivation and Culture if given specimen(**D**) identify the given Specimen [Procedure – 2; Description – 1; Identification – 1] 4 M
- IV. Describe anatomical features of the given specimen(**E**) and Identify the Given specimen (Bryophyta) (Description-2 and Identification-2) 4 M
- V. Identify giving reasons the specimens and slides.
- SPECIMENS: (F, G,H & I)**
- (Algae – 1; Fungi-1; Lichen-1, Bryophyta.1) 4 x 2 = 8 M
- SLIDES: (J,K,L&M)** (Algae – 1; Fungi-1; Lichen-1,Bryophyta.1) 4x 2 = 8M
- VI. Record & Viva-Voce 5 + 5 = 10 M

