PARVATHANENI BRAHMAYYA
SIDDHARTHA COLLEGE OF ARTS & SCIENCE
Autonomous
Siddhartha Nagar, Vijayawada–520010
Re-accredited at 'A+' by the NAAC

23BOMAL121: Non-Vascular Plants (Algae, Fungi, Lichens and Bryophytes)

Offered to: BSc. Honours (Botany) **Course Type:** Major 3 (TH)
Year of Introduction: 2023-24 **Semester**: II
Credits: 3 **60Hrs** **Max.Marks: 100(30+70)**

Course Prerequisites: Knowledge of Non-Vascular Plants (Algae, Fungi, Lichens and Bryophytes) studied in intermediate.

Course Description: This course will provide one with a basic and comprehensive understanding of Non-Vascular Plants. Enable the student with depth of topics and helps them to gain an appreciation in the Biology of selected Fungi. On the other hand, importance of understanding Introduction to Algae provides an extensive knowledge to the student.

Course Objectives:

1. Knowledge of introduction to algae.
2. The study of biology of selected algae.
3. The study of introduction to fungi.
4. Study of biology of selected fungi.
5. Knowledge of biology of bryophytes.

Course Outcomes: At the end of this course, students should be able to:

CO1: Compile the general characteristics of algae and their significance in nature. PO6
CO2: Compare and contrast the characteristics of different groups of algae. PO6
CO3: Summarise the important features of fungi and their economic value.PO5
CO4: Distinguish the characteristics of different groups of fungi.PO5
CO5: Elaborate the features and significance of amphibians of plant kingdom. PO4

CO-PO MATRIX							
CO-PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
CO1						M	
CO2						H	
CO3					M		
CO4					M		
CO5				L			

Syllabus

Course Details

Unit-1: Introduction to Algae **12Hrs.**

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 **12Hrs.**

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 **12Hrs.**

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 **12Hrs.**

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 oflichens.

Unit-5: Biology of Bryophytes **12Hrs.**

1. General characteristics of Bryophytes; Rothmaler (1951) classification.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) andlife cycle of

   (a) Hepaticopsida: *Marchantia* (b) Anthoceratopsida: *Anthoceros*

   (c) Bryopsida: *Funaria*

3. General account on evolution of sporophytes in Bryophyta.

Text Books:

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

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., NewJersey
3. Robert Edward Lee (2008) Phycology. Cambridge University Press, New York

Van Den Hoek, C., D.G.Mann & H.M.Jahns (1996)Algae : An Introduction to
4 Phycology. Cambridge University Press, New York.
5. Alexopoulos, C.J., C.W.Mims & M.Blackwell (2007) Introductory Mycology, Wiley&Sons, Inc., New York

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 ofany six algal forms excluding the genera in the syllabus.

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

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

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

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

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

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

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

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Model Paper

23BOMAL121: Non-Vascular Plants (Alagae, Fungi, Lichens and Bryophytes)

Offered to: BSc. Honours (Botany) **Course Type:** Major 3 (TH)

Semester: II

Max Marks:70 **Max Time:3Hrs**

SECTION-A

Answer the following Questions **(5x4=20)**

1. (a) What are algal pigments? Explain. **CO1,L2**.
   OR
   (b) Extend a note on life cycle types of algae. **CO1,L2**.
2. (a) Describe the *ectocarpus* unilocular/plurilocular sporangia. **CO2,L2**.
   OR
   (b) Describe about *vaucheria*. **CO2,L2**.
3. (a) Write short note on heterothallism. **CO3,L6**.
   OR
   (b) Write short note on nutrition in fungi. **CO3,L6**.
4. (a) Explain the economic importance of *pencillium*. **CO4,L4**.
   OR
   (b) Conclude the asexual reproduction in *phytopthera*. **CO4,L4**.
5. (a) Explain the structure of *marchantia*- gemmacup. **CO5,L1**.
   OR
   (b) Describe about the protonema of fungi. **CO5,L1**.

SECTION-B

Answer the following Questions **(5x10=50)**

6. (a) Write an account on thallus organization in algae. **CO1,L6**.
   OR
   (b) Write about the classification of algae by Fritsch. **CO1,L6**.
7. (a) Explain the post fertilization changes in *polysiphonia*. **CO2,L4**.
   OR
   (b) Explain the life history of *spirogyra*. **CO2,L4**.
8. (a) Describe various methods of sexual reproduction in fungi. **CO3,L2**.
   OR
   (b) Summarize an account of classification of fungi of Ainsworth. **CO3,L2**.
9. (a) Explain various steps in the life cycle of *puccinia graminis tritici* on primary host.**CO4,L2**.
   OR
   (b) Describe the structure and reproduction of lichens. **CO4,L2**.
10. (a) Write an essay on evolution of sporophyte in Bryophytes. **CO5,L6**.
    OR
    (b) Write an account of general character of Bryophytes. **CO5,L6**.

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