SRI VENKATESWARA UNIVERSITY, TIRUPATHI

4 -Year UG Honours in B.Sc. BOTANY: Minor in Consonance with Curriculum Frame work w.e.f AY 2026-27

III Semester

COURSE STRUCTURE FOR III SEMESTER MINOR

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
II	III	1	Non-vascular Plants	3	3
			Non-vascular Plants-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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COURSE 1: NON-VASCULAR PLANTS (ALGAE, FUNGI, LICHENS AND BRYOPHYTES)

Theory **Credits: 3** **3 hrs/week**

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. Summarize 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 and Significance of Bacillariophyceae (Diatoms) and Cyanophyceae (Blue Green Alga)
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.

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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) Anthoceratopsida: *Anthoceros* (c) Bryopsida: *Funaria*

3. General account on the 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: Activity: 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.

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COURSE 1: NON-VASCULAR PLANTS

(ALGAE, FUNGI, LICHENS AND BRYOPHYTES)

Practical **Credits: 1** **2 hrs/week**

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. (Agar, Spirullina etc.,)
4. **Fungi:** *Phytophthora, Rhizopus, Penicillium* and *Puccinia*
5. Identification of some fungal products available in the local market (Stale bread, Edible mushrooms, Polyporus, Yeast, Yogurt).
6. **Lichens:** Crustose, foliose and fruiticose
7. **Bryophyta:** *Marchantia, Anthoceros* and *Funaria.*

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Course 1: NON-VASCULAR PLANTS

Suggested Model Paper for Practical Examination

Max Time: 3 Hrs **Max. Marks: 50**

1. Identify any 2 algae from the mixture (material '**A**') given with specific comments about Identification. 10 M

2. Take the T.S. of material '**B**' (Fungi), make a temporary mount and make comments about identification. 10 M

3. Take the T.S. of material '**C**' (Bryophyta), make a temporary mount and make comments about identification. 10 M

4. Identify and comment on the given specimens/spotters/slides/photographs 4x 3 = 12 M

   D. From Algae
   E. From Fungi
   F. From Bryophyta
   G. From Lichens

5. Record + Viva-voce 5+3 = 08 M

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Suggested Model Question Paper for Theory Examinations

Common pattern of Theory Question Paper for Semester-End Examinations.

Max. Time: 3 Hrs. **Max.Marks:75M**

Section–A

Answer any Five of the following questions. Draw labeled diagrams wherever necessary

5 x 3 = 15 M

- ✓ Two questions should be given from each Unit of the syllabus.

Section–B

Answer any Five of the following questions. Draw labeled diagrams wherever necessary

5 x 12 = 60 M

- ✓ Two questions (a and 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.

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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