



SRI VENKATESWARA UNIVERSITY, TIRUPATHI

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

COURSE STRUCTURE (for Semester III)

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
II	III	5	Morphology and Taxonomy of Angiosperms	3	3
			Morphology and Taxonomy of Angiosperms - Practical	2	1
		6	Plant resources and Utilization	3	3
			Plant resources and Utilization –Practical	2	1
		7	Plant Ecology, Biodiversity and Phytogeography	3	3
			Plant Ecology, Biodiversity and Phytogeography –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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III Semester

COURSE 7: PLANT ECOLOGY, BIODIVERSITY AND PHYTOGEOGRAPHY

Theory

Credits: 3

3 hrs/week

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

1. Figure-out the components of ecosystem and energy flow among different trophic levels.
2. Apprise the characteristics of autecology and synecology.
3. Understand the climatic change and associated impacts on biotic components.
4. Discern the value of biodiversity, threats and conservation strategies.
5. Know the distribution of various plant groups in different geographical areas.

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

1. Explain the interactions among the biotic and abiotic components in an ecosystem.
2. Summarize the characteristics of a population and a community.
3. Anticipate the environmental problems arising due to climate change.
4. Assess the value of biodiversity and choose appropriate conservation strategy.
5. Make a survey on the distribution of various plant groups in a specified geographical area.

III. Syllabus of Theory:

Unit-1: Basic concepts in ecology

10 Hrs.

1. Ecology: definition, branches and significance; relation with other sciences.
2. Structure and functions of ecosystems- abiotic and biotic components; flow of energy.
3. Cycling of materials: water, carbon, nitrogen and phosphorus; trophic pyramids, food chains and food webs.
4. Plants and environment: Climatic (light and temperature) and edaphic factors.
5. Interactions among plants; interactions between plants and animals.

Unit-2: Population and community ecology

10Hrs.

1. Population ecology: definition, characteristics -natality, mortality, and growth curves; ecads and ecotypes
2. Community ecology: characteristics -frequency, density, cover, life forms, competition, biological spectrum, methods of studying plant communities.
3. Ecological succession: Hydrosere and Xerosere; ecological adaptations of plants.
4. Concepts of productivity: GPP, NPP and Community Respiration; Secondary production, P/R ratio and Ecosystems.

Unit-3: Climate change-impacts

8Hrs.

1. Soil degradation – causes, consequences and management strategies.
2. Deforestation, forest fires – causes, consequences and management strategies.
3. Global warming, ozone layer depletion, acid rains, ocean acidification – causes and effects.
4. Carbon foot prints, carbon credits and carbon sequestration; The Montreal and the Kyoto protocol; Plant indicators and their role in environmental monitoring.

Unit-4: Concepts of Biodiversity

10Hrs

1. Biodiversity: Basic concepts, Convention on Biodiversity - Earth Summit.
2. Value of Biodiversity; types and levels of biodiversity and Threats to biodiversity
3. Biodiversity Hot spots in India: North Eastern Himalayas and Western Ghats.
4. Ex situ and In situ conservation methods, IUCN threat-categories, RED data book
5. Role of NBPGR and NBA in the conservation of Biodiversity.



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Unit-5: Phytogeography

7 Hrs.

1. Principles of Phytogeography, Distribution (wides, endemic, discontinuous species)
2. Endemism – types and causes.
3. Phytogeographic regions of World; phytogeographic regions of India.
4. Vegetation types in Andhra Pradesh.

IV. Text Books:

1. Odum, E. P., & Barrett, G. W. (2005). Fundamentals of ecology (5th ed.). Brooks/Cole.
2. Kormondy, E. J. (2012). Concepts of ecology (4th ed.). Pearson Education.
3. Shukla, R. S., & Chandel, P. S. (2020). Plant ecology and soil science (20th ed.). S. Chand & Company Pvt. Ltd.
4. N.S.Subrahmanyam & A.V.S.S. Sambamurty (2008) Ecology Narosa Publishing House, New Delhi
5. Sharma, P.D. (2012) Ecology and Environment. Rastogi Publications, Meerut, India.
6. Chaudhuri, A. B. (2012). *Biodiversity and conservation*. Oxford University Press.
7. Krishnamurthy, K. V. (2003). *Textbook of biodiversity*. Science Publishers.

V. Reference Books:

1. Primack, R. B. (2014). *Essentials of conservation biology* (6th ed.). Sinauer Associates.
2. Begon, M., J.L. Harper & C.R. Townsend (2003) Ecology, Blackwell Science Ltd., U.S.A.
3. Eugene P. Odum (1996) Fundamentals of Ecology, Natraj Publishers, Dehradun
4. Kumar, H.D. (1992) Modern Concepts of Ecology (7th Edn.), Vikas Publishing Co., New Delhi.
5. Newman, E.I. (2000): Applied Ecology Blackwell Scientific Publisher, U.K.
6. Kumar H.D. (2000) Biodiversity & Sustainable Conservation Oxford & IBH Publishing Co Ltd. New Delhi.
7. Cox, C. B., & Moore, P. D. (2010). Biogeography: An ecological and evolutionary approach (8th ed.). Wiley-Blackwell.
8. Ambasht, R.S., & Ambasht, N. K. (2023). A Textbook of Plant Ecology (16th ed.). CBS Publishers & Distributors.

VI. Suggested activities and evaluation methods:

Unit-1: Activity: Field visit to local ecosystems and making a report on biotic and abiotic components and their interactions.

Evaluation method: Valuation of record of attendance and report submission with conclusions
Unit-2: Activity: Case studies on population and community ecologies and making a comprehensive report

Evaluation method: Assessing the report and awarding grade

Unit -3: Activity: Case studies on global and local climatic changes and their impacts, preparing a comprehensive report.

Evaluation method: Assessing the report and awarding grade.

Unit- 4: Activity: Making a survey in their locality to identify endangered and threatening species.

Evaluation method: Assessing the survey report and assigning a grade based on a rubric. **Unit- 5:**

Activity: Collection of data on flora of their locality and preparing a project report.

Evaluation method: Assessing the project report and awarding a grade.


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COURSE 7: PLANT ECOLOGY, BIODIVERSITY AND PHYTOGEOGRAPHY

Practical

Credits: 1

2 hrs/week

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

1. Handle instruments used in ecological studies.
2. Perform experiments and collect data on autecology and synecology.
3. Identify various plant groups based on their morphological and anatomical adaptations.
4. Collect data on biodiversity and phytogeography.

II. Laboratory/field exercises:

1. Study of instruments used to measure microclimatic variables;
 - a. Soil thermometer, b. Maximum and minimum thermometer,
 - c. Anemometer, d. Rain gauge, e. Lux meter.
2. Visit to the nearest/local meteorology station where the data is being collected regularly and record the field visit summary for the submission in the practical.
3. Study of morphological and anatomical adaptations of any two hydrophytes.
4. Study of morphological and anatomical adaptations of any two xerophytes.
5. Quantitative analysis of herbaceous vegetation in the college campus for frequency, density and abundance
6. Identification of vegetation/various plants in college campus and comparison with Raunkiaer's frequency distribution law.
7. Find out the alpha-diversity of plants in an area
8. Mapping of biodiversity hotspots of the world and India.
9. Mapping of phytogeographical regions of the globe and India.

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with Curriculum Frame work w.e.f AY 2026-27
III Semester**

COURSE 7: PLANT ECOLOGY, BIODIVERSITY AND PHYTOGEOGRAPHY

Suggested Model Paper for Practical Examination

Max Time: 3 Hrs

Max. Marks: 50

1. Perform quantitative analysis of herbaceous vegetation in the given area and calculate:
Frequency / Density / Abundance - 'A' 12 M
2. Study the morphological and anatomical adaptations of material 'B' (Hydrophytes/ Xerophytes).
Draw neat labeled diagrams. 10 M
3. Study and explain the working principle and uses of the given microclimatic instrument-
'C' 08 M
4. Identify and comment on the given specimens/spotters/slides/photographs $4 \times 3 = 12 M$
 - D. From Plant Ecology
 - E. From Population and community ecology
 - F. Biodiversity hotspot (map pointing)
 - G. Phytogeographical region (map pointing)
5. Record & Viva-voce $5 + 3 = 08 M$

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III Semester

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 labelled 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 labelled 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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4- Year UG Honours, Major
Syllabus
(2026-27)
Semester-III

Model Question Paper

Time : 3hrs

Marks:75

Part-A

Answer any Five Questions. Each Question carries 3 Marks.

5x3=15

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

Answer the following questions. Each question carries 12 Marks

5x12=60

11. a) Unit-I
(Or)
b) Unit-I

12. a) Unit-II
(Or)
b) Unit-II

13. a) Unit-III
(Or)
b) Unit-III

14. a) Unit-IV
(Or)
b) Unit-IV

15. a) Unit-V
(Or)
b) Unit-V