



**SARVODAYA KELAVANI SAMAJ MANAGED,
SHREE MANIBHAI VIRANI & SMT. NAVALBEN VIRANI SCIENCE
COLLEGE**

AN AUTONOMOUS COLLEGE- AFFILIATED TO SAURASHTRAUNIVERSITY, RAJKOT

Re-accredited at the 'A' Level (CGPA 3.28) by NAAC

'STAR' College Scheme & Status by MST-DBT

A College with Potential for Excellence - CPE (Phase-II) by UGC

UGC-DDU KAUSHAL Kendra

Accredited at the G-AAA Highest Grade 'A-1' Level by KCG, Govt. of Gujarat

UGC-DDU KAUSHAL Kendra

GPCB-Government of Gujarat approved Environment Audit Centre

Enclosure I (G)

DSE Allied Zoology

Semester IV

(With Microbiology)

19UMBDA401	Basics Of Ecology	3 Hrs/Week	3 Credits
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Objective:

- Educating the students about the need to necessity, conservation and protection about ecology and environment and microbial ecology as welfare of human and its future.
- To enable the students to understand the roll of ecology in environment, its importance, habitat, interaction, and abiotic component cycle etc.

Unit 1: Introduction

- History, basic concepts and scopes

- Chemical evolution for the Origin of life.
- Biological evolution for the Origin of life.
- Ecosystem – structure, function and types
- Abiotic factors – Water, Light, Temperature

Unit 2: Habitat Ecology

- Terrestrial Habitat – Soil formation, constituents, types, profile, soil organism.
- Aquatic Habitat – Types, Stratification and Zonation.
- Atmosphere – Structure and Stratification.
- Air and Gases, Aerosol.
- Habitat loss - Causes and Effects.

Unit 3: Community and interaction

- Community - Composition, Structure, Quantitative characters, Qualitative characters.
- Interaction – Mutualism, Commensalism, Antagonism, competition.
- Succession – Introduction, General process, Cause, types, Hydrosere, Lithosere.
- Population Dynamics – Size, Frequency, Density, Abundance.
- Population Natality, Mortality, Dispersion and Age structure.

Unit 4: Biogeochemical Cycles

- Carbon cycle
- Nitrogen Cycle
- Phosphorous cycle
- Sulfur cycle
- Oxygen cycle

Unit 5: Microbial Ecology

- History and development, Major contribution
- Soil as habitat natural habitat, Soil microflora
- Air microflora and Microb dispersal
- Microbiomics reference to Human.

- Micro Interaction – with Microb, Plant and Animal.

Text Books:

- Arumugam, Concepts of Ecology, seventh edition, 2010, Saras publication.
- Verma, P. S., & Agarwal, V. K. (2015). *Environmental Biology: Principles of Ecology.*, S. Chand publication, New Delhi.

Reference Books:

- Odum, E. P., & Barrett, G. W. (1971). *Fundamentals of ecology.* Philadelphia: Saunders.
- Groom, M. J., Meffe, G. K., & Carroll, C. R. (2006). *Principles of conservation biology,* Sunderland: Sinauer Associates publishing.

PRACTICALS:

19UMBDA402	Basics Of Ecology Practical	6 Hrs/Week	2 Credits
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Objectives:

- Enhancing the student's practical work about the environmental conservation and protection by ecological grip on hands.
- To enable the students to understand the roll of ecology in environment, its importance, future necessity and control of pollution by practical works.

1. Study of Aquatic ecosystem
 - a. Pond ecosystem
 - b. Oceanic Zonetion
2. To Compare the chemical characteristics of soil - I
 - a. pH
 - b. Moisture content

3. To Compare the chemical characteristics of soil - II
 - a. Carbonate content
 - b. Nitrate content.
4. Estimation of Chlorinity in water.
5. Estimation of carbondioxide in tap water.
6. Measurement of water quality, based on Hardness.
7. Measurement of water quality, based on BOD and COD.
8. Study of Biotic-interaction.
9. Study of Ecological adaptation part I.
10. Study of Ecological adaptation part II.
11. To determine 'species Area curve' and community size by quadrature method.
12. To determine Frequency of the community by quadrature method.
13. To determine Density of the community by quadrature method.
14. To determine Abundance of the community by quadrature method.
15. To determine population strength by quadrature method.
16. To calculate Median for community dynamics.
17. To calculate Mode for community dynamics.
18. To calculate Mean for community dynamics.
19. To determine Water holding capacity of the soil from deferent soil samples.
20. To count planktonic population among polluted water.
21. Study of Marine Habitat and stratification.
22. Habitat study of Desert Area.
23. Habitat study of Forest Area.
24. Habitat study of Fresh water Area.

References:

- Arumugam, Concepts of Ecology, seventh edition, 2010, Saras publication.
- Verma, P. S., & Agarwal, V. K. (2015). *Environmental Biology: Principles of Ecology.*, S. Chand publication, New Delhi.

