Institute of Zoology
Faculty of Life Sciences
University of the Punjab, Lahore
Course Outline

Programme	BS Zoology	**Course Code**	**ZOOL-304**	**Credit Hours**	1
Course Title	**Lab- Environmental Biology**				

Course Introduction

Environmental Biology explores a wide range of themes, including energy flow, natural resources, carbon trading, biogeochemical cycles, greenhouse gas emissions, water resource management, land degradation and rehabilitation, biodiversity, habitat destruction, deforestation, energy and mineral depletion, pollution, soil erosion, and groundwater contamination. This course provides foundational knowledge in environmental biology, helping students understand and recognize environmental challenges such as climate change, global warming, ozone layer depletion, and acid rain.

Learning Outcomes

1. To acquire knowledge of natural systems which make life possible on Earth
2. To gain an understanding that humans are part of these systems and depend on them
3. To acquire an awareness of the need to manage natural systems
4. To get an awareness of their own values concerning environmental issues
5. To understand the relationship between human health and environmental health.
6. Outline changes in economics, policy, and education that promote environmental sustainability.
7. To understand the natural energy resources and their management.

Course Content	**Assignments/Readings**
Week 1	Demonstration of Analysis of polluted and freshwater for various pollutants
Week 2	Determination of dissolved oxygen in given water sample
Week 3	Determination of CO_2 in given water sample
Week 4	Determination of Chloride ion in given water sample
Week 5	Determination of carbonate and bicarbonate ion in given water sample
Week 6	Demonstration and guidelines for Field Sampling of Aquatic Biota
Week 7	Measurement of pollutants levels; In atmosphere (NO_2, SO_2, O_3 and comparison with rural air).
Week 8	In soil (toxic chemical, fertilizer, insecticides, pesticides, herbicides
Week 9	Impact of radiation on growth of plants
Week 10	Effect of noise on animal behaviour
Week 11	Demonstration on Field visit for selected aquatic ecosystem and identification of the environmental issues
Week 12	Field visit for selected aquatic ecosystem and identification of the environmental issues
Week 13	Development of Environmental Management Plan by a group of students for a hypothetical or real organization
Week 14	Visit to any industry and describe their waste management practices
Week 15	Writing notes about visit to any industry and describe their waste management practices.
Week 16	Preparation of a project about contemporary environmental themes

Textbooks and Reading Material

1. Textbooks.

1. Henderson, P. A. (2003). Practical methods in ecology. John Wiley & Sons.
2. Clements, F. E. (1905). *Research methods in ecology*. University Publishing Company.
3. Weiner, J. (1995). On the practice of ecology. *Journal of Ecology*, *83*(1), 153-158.
4. Southwood, T. R. E., & Henderson, P. A. (2009). *Ecological methods*. John Wiley & Sons.
5. Radojevic, M., & Bashkin, V. N. (1999). *Practical environmental analysis*. Royal society of chemistry.

2. Suggested Research Articles

1. Boitani, L., & Fuller, T. K. (2000). *Research techniques in animal ecology: controversies and consequences*. Columbia University Press.
2. Turner, A. M., & Trexler, J. C. (1997). Sampling aquatic invertebrates from marshes: evaluating the options. *Journal of the North American Benthological Society*, *16*(3), 694-709.

Teaching Learning Strategies

Teaching will be a combination of class lectures, lab work, field visits, class discussions, and group work. Short videos/films will be shown on occasion.

Assignments: Types and Number with Calendar

The sessional work will be a combination of written assignments, class quizzes, projects, presentation,]and class participation/attendance.

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.