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

Programme	BS Zoology	**Course Code**	**NZ-116**	**Credit Hours**	2
Course Title	**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	**Unit-1: Environment** 1.1 The Environment as a system 1.2 Origin of Solar system and Earth	
	1.3 Abiotic or Non-living Environment (Atmosphere, Light, Water and Soil) 1.4 Biotic or Living Environment (interspecific and Intraspecific association)	
Week 2	**Unit-2 The Human Population** 2.1 Human Population and its limits 2.2 Natality, Mortality, and Life expectancy	
	2.3 Global Family planning	
Week 3	**Unit-3 Major environmental Issues their causes, effects and control** 3.1 Greenhouse gases 3.2 Global Warming	
	3.3 Ozone Depletion 3.4 Climate Change	
Week 4	3.5 Deforestation 3.6 Desertification 3.7 Acid Rain	

	Unit-4 Pollution 4.1 Water Pollution 4.1.1 Major water pollutants 4.1.2 Water born Human Diseases 4.1.3 Prevention and Control of Water pollution 4.1.4 Sewage water treatment plant	
Week 5	**4.2 Air Pollution** 4.2.1 Types of air pollutants 4.2.2 Major causes of air pollution 4.2.3 Indoor air pollution 4.2.4 Effects and control air pollution	
	4.3 Soil Pollution 4.3.1 Nature of agrochemicals and implication to soil environment 4.3.2 Adverse impacts of agrochemicals on soil quality 4.3.3 Environmental effect of soil acidification	
Week 6	**4.4 Radiation pollution** 4.4.1 Radioactivity in nature 4.4.2 Types of radiations 4.4.3 Decay chains 4.4.4 Causes, effect and control of radioactive pollution	
	4.5 Noise Pollution 4.5.1 Sources and units of Noise 4.5.2 Health damage from noise 4.5.3 Control of noise	
Week 7	**Unit-5 Pesticide** 5.1 Synthetic organic Pesticides 5.2 Inorganic pesticides	
	5.3 Chemical pesticides 5.4 Advantages and Disadvantages of Pesticides	
Week 8	**Unit-6 Natural Resources and their management** 6.1 Classification of natural resources	
	6.2 Land Resources and their management	
Week 9	6.3 Water Resources and their management	
	6.4 Rangeland resources and their management	
Week 10	6.5 Wildlife and fish resource management	
	Unit-7 Urban Environment 7.1 Urban Lifestyle	
Week 11	7.2 Environmental Histories of Cities	
	7.3 City planning and the environment	
Week 12	**Unit-8 Waste production and management** 8.1 Material and waste management	
	8.2 Integrated waste management	
Week 13	8.3 Municipal solid waste management	

	8.4 Hazardous waste management	
Week 14	**Unit-9 Our Environmental Future** 9.1 Environmental Management	
	9.2 Planning to provide Environmental Goods and Services	
Week 15	9.3 Chemical and Biological Warfare	
	9.4 Environmental Laws and Diplomacy	
Week 16	9.5 Fundamentals of Remote sensing and GIS	
	9.5 Fundamentals of Remote sensing and GIS	

Textbooks and Reading Material

Textbooks.

1. Botkin, D. B., & Keller, E. A. (2011). *Environmental science : Earth as a living planet* (Seventh edition). Wiley ; John Wiley & Sons.

2. G. Tyler Miller, Jr. 2002. Living in the Environment. Principles, Connections and Solutions. Book/Cole Thomson Learning, USA

3. M.L. McKinney. 2007. Environmental Science: *System and Solution*. 4th Edition. Jones and Bartlett Publication, Boston, USA

4. Nebel, B. J., & Wright, R. T. (1990). *Environmental science : the way the world works* (3rd ed). Prentice Hall.

5. E. P. Odum. 1976. Fundamentals of Ecology National Book Foundation, Islamabad.

6. E.P. Odum. 1996. Ecology: A Bridge between science and society.

7. J.L. Chapman and M.J. Reiss, 1997. Ecology. Cambridge University Press, UK.

8. M.C. Molles. 1999. Ecology: *Concepts and applications* WCB/McGraw Hill, New York

9. Book/Cole Thomson Learning, USA

10. R. Lloyd.1992. Pollution and Freshwater. Fishing News Books

Suggested Readings Books

1. R.K. Singh. 1998. Human Ecology.
2. Smith, 1988. Ecology and Field Biology. National Book Foundation, Islamabad.
3. Krebs. 2000 Ecology: The experimental analysis of distribution and application.

Teaching Learning Strategies

Teaching will be a combination of class lectures, 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.