

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



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| Programme | BS Zoology | Course Code | ZOOL-303 | 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 | | | | | |
| <ol style="list-style-type: none"> 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 | | | | |

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| | 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 Waste production and management 6.1 Material and waste management | |
| | 6.2 Integrated waste management | |
| Week 9 | 6.3 Municipal solid waste management | |
| | 6.4 Hazardous waste management | |
| Week 10 | Unit-7 Environmental Management perspectives and sustainability 7.1 Eco crisis 7.2 Environmental ethics and politics | |
| | 7.3 Environmental economics 7.4 Chemical and Biological Warfare | |
| Week 11 | 7.5 Fundamentals of Remote Sensing and GIS | |
| | Unit-8 Natural Resources and their management 8.1 Classification of natural resources | |
| Week 12 | 8.2 Land Resources and their management | |
| | 8.3 Water Resources and their management | |
| Week 13 | 8.4 Rangeland resources and their management | |
| | 8.5 Wildlife and fish resource management | |

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| Week 14 | Unit-9 Urban Environment 9.1 Urban Lifestyle | |
| | 9.2 Environmental Histories of Cities | |
| Week 15 | 9.3 City planning and the environment | |
| | Unit-10 Our Environmental Future 10.1 Environmental Management | |
| Week 16 | 10.2 Planning to provide Environmental Goods and Services | |
| | 10.3 Planning for recreation on public lands | |
| | 10.4 Environmental Laws and Diplomacy 10.5 Sustainable use of environmental resources | |

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. |