



**JYOTI NIVAS COLLEGE AUTONOMOUS BANGALORE – 560 095**  
**DEPARTMENT OF ZOOLOGY**  
**B.Sc. VI SEMESTER ZOOLOGY PAPER VIII SYLLABUS (2021 NEP BATCH)**  
**ENVIRONMENTAL BIOLOGY, WILDLIFE MANAGEMENT &**  
**CONSERVATIONS**

<b>COURSE TITLE</b>	<b>ENVIRONMENTAL BIOLOGY, WILDLIFE MANAGEMENT &amp; CONSERVATIONS</b>
<b>COURSE CODE</b>	<b>21VIZL8 (T)</b>
<b>COURSE CREDITS</b>	<b>04</b>
<b>TOTAL CONTACT HOURS</b>	<b>60</b>
<b>DURATION OF ESE</b>	<b>2 ½ Hours</b>
<b>CONTINUOUS INTERNAL ASSESSMENT (CIA)</b>	<b>40 Marks</b>
<b>END SEMESTER EXAMINATION (ESE)</b>	<b>60 Marks</b>

**Course Objectives:**

1. To understand the interaction between the animals and abiotic factors in the environment
2. To use the fundamental principles of wildlife ecology to solve local, regional and national conservation and management issues.
3. To gain an appreciation for the modern scope of scientific inquiry in the field of wildlife conservation management.

**Course Outcomes (COs)**

After the successful completion of the course, the student will be able to:

1. Develop an understanding of how animals interact with each other and their natural environment.
2. Attain a basic understanding of the anthropogenic effect on the environment and how these environmental issues can be mitigated and the urgent need to conserve biodiversity for the survival of mankind
3. Develop the ability to use the fundamental principles of wildlife ecology to solve local, regional, and national conservation and management issues.
4. Gain an appreciation for the modern scope of scientific inquiry in the field of wildlife conservation management.
5. Develop an ability to analyze, present and interpret wildlife conservation management information and ability to work on collaborative team-based projects.

## CO Mapping with Knowledge Levels

CO No.	Course outcomes statement	Knowledge level
1	Develop an understanding of how animals interact with each other and their natural environment	K1,K2, K4
2	Attain a basic understanding of the anthropogenic effect on the environment and how these environmental issues can be mitigated and the urgent need to conserve biodiversity for the survival of mankind	K1,K2, K3, K4
3	Develop the ability to use the fundamental principles of wildlife ecology to solve local, regional, and national conservation and management issues.	K1, K2, K3, K4, K5
4	Gain an appreciation for the modern scope of scientific inquiry in the field of wildlife conservation management	K1, K2, K3, K4
5	Develop an ability to analyze, present, interpret wildlife conservation management information and ability to work on collaborative team-based projects	K1, K2, K3, K4, K5. K6

**Knowledge Levels-** K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

## Mapping of Course Outcomes (COs) with Program Outcomes (Pos)

	CO1	CO2	CO3	CO4	CO5
PO1	✓	✓	✓	✓	✓
PO2	✓	✓	✓	✓	✓
PO3		✓		✓	✓
PO4		✓	✓	✓	✓
PO5					
PO6			✓		
PO7	✓	✓	✓	✓	✓
PO8	✓	✓	✓	✓	✓
PO9		✓	✓	✓	✓
PO10	✓	✓	✓	✓	✓

## Programme Objectives aligned with Graduate attributes

PO1- Knowledge, PO2- Scientific thinking, PO3- Entrepreneurial skills  
 PO4- Analytical skills , PO5- Communication skills, PO6- Social commitment  
 PO7- Research and Inquiry , PO8- Conservation of Environment\  
 PO9- Employability, PO10- Academic orientation



**Chapter 1: Ecosystem****7 Hrs.**

Definition, Components of ecosystem and types of ecosystems. Abiotic environmental factors (Climatic factors, topographic factors, edaphic factors). Biotic factors (Producers, Consumers and Decomposers) of ecosystem. Intra and inter-specific interactions - Neutral (neutralism), positive (mutualism, co-operation, and commensalism), and negative (antibiosis, exploitation and competition) of ecosystem, Energy flow in ecosystem, Law's of thermodynamic. Different Food chains, food webs, trophic levels and types of ecological pyramids.

**Chapter 2: Environment****8 Hrs.**

Introduction to Environment, Components of biosphere (atmosphere, hydrosphere, lithosphere), Types of environments - terrestrial, aquatic, desert, grassland, and aerial environment with example. Principle of Limiting factors and Liebig's law of minimum and Shelford's law of tolerance.

**Chapter 3: Pollution I****8 Hrs.**

Definition and types of pollution. Air pollution: Measures to detect, Causes, Health hazards in man (COPD, Silicosis and Emphysema) and mitigating methods for air pollution. Water pollution: Measures to detect, Causes, Health hazards in man (Minimata disease, Itai-itai disease) and mitigating methods for water pollution. Bioaccumulation and Biomagnification. Environmental Impact Assessment -carbon footprint and green audit.

**Chapter 4: Pollution II****7 Hrs.**

Pollutants of public health hazards. Radiation hazards due to ionizing, non-ionizing, microwave, and atomic radiation. Chemical pollutants and their harmful effects, Ozone layer depletion, global warming, ocean warming, acid rain, La Nina and El-Nino, Xenobiotics, Synergism, and Antagonism. Bioremediation (Bio-adsorption and Bio-degradation). Solid waste management.

**Chapter 5: Wildlife Management I****8 Hrs.**

Values of wildlife (aesthetic and recreational, ecological, and economic). Threats to wildlife (loss of habitat, disease, poaching, and inconsistent/inefficient management). Types, importance, and concerns of Wildlife Corridor. The concept of home range and territory, wild animal census and methods of estimating animal numbers.

**Chapter 6: Wildlife Management II****7Hrs.**

Human-wildlife conflict. Inventory and classification of wetlands and their biotic components, general strategies, and issues of wildlife management. Remote sensing and GIS for tracing the movement of wildlife

**Chapter 7: Wildlife Conservation I****8 Hrs.**

Introduction to Wildlife Conservation, red data book, endangered species, Ex-situ and in-situ conservation, Biodiversity hotspots, major National parks and Wildlife sanctuaries of India.

**Chapter 8: Wildlife Conservation II****7 Hrs.**

Project Elephant and Project Lion, Project Tiger, Breeding in captivity, Causes and depletion of wildlife, wildlife Protection Act 1972.

**ZOOLOGY PRACTICAL PAPER VIII**

<b>COURSE TITLE</b>	<b>ENVIRONMENTAL BIOLOGY, WILDLIFE MANAGEMENT &amp; CONSERVATIONS</b>
<b>COURSE CODE</b>	<b>21VIZL8 (P)</b>
<b>COURSE CREDITS</b>	<b>02</b>
<b>TOTAL CONTACT HOURS</b>	<b>4 hours/week</b>
<b>DURATION OF ESE</b>	<b>03 hours</b>
<b>CONTINUOUS INTERNAL ASSESSMENT (CIA)</b>	<b>25 Marks</b>
<b>END SEMESTER EXAMINATION (ESE)</b>	<b>25 Marks</b>

**Experiments**

1. **Water quality parameters assessment:** Collection of water sample and estimation of Dissolved Oxygen, dissolved organic matter, chlorides and salinity estimation in water.
2. **Analysis of air pollution:** Air monitoring for particulate matter.
3. **Analysis of physico-chemical parameters of soil:** pH, soil moisture, organic matter in soil.
4. **Visit of ponds and lakes:** Collection and identification of zooplankton and aquatic fauna.
5. **Demonstration of field equipment used in wildlife census:** Compass, Binoculars, Spotting scope, Range Finders, Global Positioning System, Various types of cameras and lenses
6. Identification of wild animal's pugmarks, hoof marks scars, pellet groups, nest, and antlers
7. Project work on any topic related to Ecology, Environment biology, Wildlife biology, Habitat study, Animal conservation, Conservation ecology, and Environmental impact assessment

Or

Field visits to nearby National parks/ Wildlife sanctuaries/ any National laboratory at the end of the semester is compulsory and the report of this is to be submitted along with a practical record as a part of the practical examination

### **Suggested activities-**

Submission of field report on animal biodiversity or bird watching for a minimum period of 4 weeks observation in a locality.

Submission of photo album of invertebrates and vertebrates with identification and classification

### **References**

1. Colinvaux, P.A. (1993) Ecology (2nd edition) Wiley, John and Sons, Inc.
2. Krebs, C.J. (2001) Ecology (6th edition) Benjamin Cummings.
3. Odum, E.P., (2008) Fundamentals of Ecology. Indian Edition. Brooks/Cole. (3rd Edition) Blackwell Sci.
4. Kendeigh, F C. (1984) Ecology with Special Reference to Animal and Man. Prentice Hall Inc.
5. Caughley, G., and Sinclair, A.R.E. (1994) Wildlife Ecology and Management. Blackwell Science.
6. Woodroffe, R., Thirgood, S. and Rabinowitz, A. (2005) People and Wildlife, Conflict or Co-existence? Cambridge University.
7. Bookhout, T.A. (1996) Research and Management Techniques for Wildlife and Habitats (5th edition) The Wildlife Society, Allen Press.
8. Sutherland, W.J. (2000) The Conservation Handbook: Research, Management and Policy. Blackwell Sciences
9. Hunter M.L., Gibbs, J.B. and Sterling, E.J. (2008) Problem solving in Conservation
10. Biology and Wildlife Management: Exercises for Class, Field, and Laboratory. Blackwell Publishing.