



# Yogoda Satsanga Mahavidyalaya

JAGANNATHPUR, DHURWA, RANCHI – 834004

Email address: [ysmranchi4@gmail.com](mailto:ysmranchi4@gmail.com)

(NAAC Accredited, Grade: B++, CGPA: 2.89)

## Course plan

**NAME OF THE DEPARTMENT:** Zoology

**NAME OF THE FACULTY:** Dr. Anjana Verma – units-1, 2,

Dr. Rakhee Lohia- units- 3,4,5

**ACADEMIC SESSION:** August 2022

**YEAR:** 2022

**PROGRAM:** B. Sc.

**SEMESTER:** I

**COURSE TYPE:** Core

**COURSE:** Ecology

**COURSE CODE:** CC-2

**TOTAL CREDIT:** 6 (4 Theory + 02 Practical)

### Program Outcomes (POs):

**Student should be able to,**

**PO1-** Apply the knowledge and concepts of biology and its fundamental principles and to identify, analyze and find solutions to various biological problems.

**PO2-** Identity, hypothesize, and review available research literature, and analyze complex biological issues reaching substantiated conclusions using knowledge of biodiversity, environment, and biological functioning.

**PO3-** Develop scientific temperament, an ability to merge, interconnect and extrapolate information and knowledge across various streams.

**PO4-** Ability to decide appropriate technology and tools to solve problems. Understand the availability, of resources, their judicious use, and the execution of the project in sustainable way.

**PO5-** Design solutions for complex scientific problems and design processes that meet the specified needs with appropriate consideration for public health & safety, cultural, societal, legal, constitutional and environmental considerations.

**PO6-** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO7-** Communicate effectively on complex scientific activities with the science community and with society at large, such as, being able to comprehend and write effective reports and design documents, make effective presentations, and give and receive clear instructions.



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**PO8-** Demonstrate knowledge and understanding of the scientific principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO9-** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of scientific developments, technological advancements and global changes.

**PO10-** Value and foster Physical, Physiological and Psychological well-being through personal practice and conduct. Ability to apply the learnings for a lifelong commitment to ethics in fulfilment of professional and social obligations.

**PO11-** Apply academic learning to promote higher studies, sustainable living through employment, and initiation of entrepreneurial advent to create opportunities and wealth for self and society.

**PO12-** Value and support social causes and rural development through service and philanthropic activities.

## **PROGRAM-SPECIFIC OUTCOMES (PSOs):**

**Student should be able to,**

**PSO1:** An ability to demonstrate in-depth knowledge and understanding of the fundamental concepts, principles, and processes underlying the academic field of Zoology and its different subfields like animal diversity, principles of ecology, comparative anatomy and developmental biology of vertebrates, physiology, endocrinology, biochemistry, genetics, and evolutionary biology, animal biotechnology, applied Zoology, aquatic biology, immunology, reproductive biology, parasitology, entomology, apiculture, aquarium fish keeping, medical diagnostics, and sericulture.

**PSO2:** Development of procedural knowledge and merging it with the advanced techniques available to create different types of professionals in the field of Zoology and related fields such as Apiculture, Fisheries, Medical Diagnostics, Sericulture, Paleozoology, Ornithology, Herpetology, Forensics, Bioinformatics, and Arachnology.

**PSO3:** Understand and appreciate the complexity of life processes, their molecular, cellular, and physiological processes, their genetics, evolution, and behavior, and their interrelationships with the environment.

## **COURSE OUTCOMES (COs):**

**CO1:** Aware of the surroundings and define the concept of a healthy bio ecosystem.

**CO2:** Identify the key problem area and probable initiatives to protect and nurture the bio ecosystem.

**CO3:** Development of the value and appreciation for healthy co-existence.

**CO4:** Ability to evolve and think out of the box methodologies to create sustainable environments

**CO5:** Develop rationality behind the action and the ability to critically analyze the outcomes.



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## Correlation between POs and COs

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1	3	-	2	2	-	-	-	-	2	3	3	3	-	1
CO2	-	-	3	-	-	-	-	-	2	2	-	3	-	-
CO3	-	-	-	-	-	-	-	-	2	2	2	2	-	2
CO4	-	-	3	2	1	1	-	-	2	2	-	2	-	3
CO5	-	-	3	-	3	-	-	-	-	-	-	-	3	3

1. Weak

2. Moderate

3. Strong

## Course teaching and learning activities

### A. PEDAGOGY

- i. Whiteboard
- ii. Group Discussions

### B. COURSE COMPLETION PLAN

UNIT	NO. OF LECTURES			TEST	QUIZ	ASSIGNMENT
	THEORY	PRACTICAL	TUTORIAL			
1	6	10		1	1	
2	24	20		1	1	
3	12	12		1	1	
4	14	10		1	1	
5	4	8		1	1	



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## COURSE DELIVERY PLAN:

UNIT	TOPIC/SUBTOPIC	LECTURE REQUIRED	CO ADDRESSED	ASSIGNMENT/ TEST/QUIZ
1	Introduction to Ecology History of ecology, Autecology and synecology, levels of organization, Laws of limiting factors, Study of physical factors	6	CO 1, 2✓	
2	Population Unitary and Modular populations, Unique and group attributes of population: Density, natality, mortality, life tables, fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion; Exponential and logistic growth, equation and patterns, r and K strategies, Population regulation - density-dependent and independent factors; Population interactions, Gause's Principle with laboratory and field examples, Lotka-Volterra equation for competition and Predation, functional and numerical responses	24	CO 1, 2, 3	
3	Community Community characteristics: species richness, dominance, diversity, abundance, vertical stratification; Ecotone and edge effect; Ecological succession with one example; Theories pertaining to climax community.	12	CO 1, 4, 5	
4	Ecosystem Types of ecosystem with one example in detail, Food chain, Detritus and grazing food chains, Linear and Y-shaped food chains, Food web, Energy flow through the ecosystem, Ecological pyramids and Ecological efficiencies. Nutrient and biogeochemical cycle with one example of Nitrogen cycle or carbon cycle. Human modified ecosystem.	14	CO 1, 4, 5	
5	Applied Ecology Ecology in wildlife conservation and management.	4	CO5	





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## C. SUGGESTED READINGS

### a. TEXT BOOKS

- a. Colinvaux, P. A. (1993). Ecology. II Edition. Wiley, John and Sons, Inc.
- b. Krebs, C. J. (2001). Ecology. VI Edition. Benjamin Cummings.
- c. Mukherjee, B. 2012. Fundamentals of Environmental Biology. Silverline Publications, Allahabad.
- d. Odum, E.P., (2008). Fundamentals of Ecology. Indian Edition. Brooks/Cole
- e. Robert Leo Smith Ecology and field biology Harper and Row publisher.
- f. Ricklefs, R.E., (2000). Ecology. V Edition. Chiron Press.

### b. VIDEO RESOURCE

### c. WEB RESOURCES:-

### d. E-RESOURCES