



# Yogoda Satsanga Mahavidyalaya

JAGANNATHPUR, DHURWA, RANCHI – 834004

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

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

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## Course plan

<b>NAME OF THE DEPARTMENT</b>	: Zoology
<b>NAME OF THE FACULTY</b>	: <b>Dr. Anjana Verma</b> <b>Dr. Kumari Pragati Nanda</b> <b>Mr. Ankit</b>
<b>ACADEMIC SESSION</b>	: September 2023
<b>YEAR</b>	: 2023
<b>PROGRAM</b>	: FYUGP
<b>SEMESTER</b>	: I
<b>COURSE TYPE</b>	: <b>Major</b>
<b>COURSE</b>	: <b>Chordates and Non-Chordates</b>
<b>COURSE CODE</b>	: <b>MJ 1</b>
<b>TOTAL CREDIT</b>	: <b>04 = (04 Theory)</b>

### 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-** Identify, 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, interconnects and extrapolates 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.



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**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.

**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.



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

## COURSE OUTCOMES (COs):

1. Identify the key characteristics and classifications of non-chordate organisms, including different sects of protists, phyla Porifera, Cnidaria, Ctenophora, Helminthes, Annelida, Arthropoda, Mollusca, and Echinodermata.

2. Describe the reproductive and locomotive mechanisms in various non-chordate organisms, such as Protista, Porifera, Cnidaria, and Mollusca, based on their anatomical structures and physiological processes.

3. Explain the evolutionary significance and ecological roles of non-chordate organisms, considering their adaptations, habitat preferences, and interactions within ecosystems.

4. Analyze the similarities and differences in the anatomical structures and physiological processes among different classes of chordates, including Protochordates, Agnatha, Pisces, Amphibia, Reptilia, Aves, and Mammalia.

5. Evaluate the impact of environmental factors on the behavior, physiology, and evolutionary trajectories of chordate organisms, demonstrating a comprehensive understanding of their ecological roles and conservation implications.

## CORRELATION BETWEEN POs AND COs

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	1	2	1	2	-	-	-	3	2
CO2	3	2	1	1	1	2	3	2	2	-	-	-	2	2
CO3	3	3	2	2	2	3	3	3	3	-	-	-	3	3
CO4	3	3	3	2	2	3	3	3	3	-	-	-	3	3
CO5	3	3	3	3	3	3	3	3	3	-	-	-	2	2

1. Weak

2. Moderate

3. Strong

## Course teaching and learning activities



## A. PEDAGOGY

- i. Whiteboard
- ii. Flipped Class
- iii. Debate
- iv. Group Discussions
- v. PPT
- vi. Technology based learning
- vii. Lab work

## B. COURSE COMPLETION PLAN

UNIT	NO. OF LECTURES		TEST	QUIZ	ASSIGNMENT
	THEORY	TUTORIAL			
1	19		1	1	1
2	7		1	1	-
3	12		1	1	1
4	4		1	1	-
5	10		1	1	-
6	8		1	1	-

### A. SUGGESTED READINGS

#### a. TEXT BOOKS

1. Raziuddin, M., Mishra P.K. 2014, A Handbook of Environmental Studies, Akanaksha Publications, Ranchi
2. Mukherjee, B. 2011: Fundamentals of Environmental Biology. Silverline Publications, Allahabad.
3. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
4. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
5. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
6. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.

#### b. REFERENCE BOOKS



1. Barnes, R. D. (1987). Invertebrate Zoology (5th ed.). Saunders College Publishing.
2. Hickman, C. P., Roberts, L. S., Keen, S. L., Larson, A., & Eisenhour, D. J. (2012). Animal Diversity (7th ed.). McGraw-Hill Education.
3. Ruppert, E. E., Fox, R. S., & Barnes, R. D. (2003). Invertebrate Zoology: A Functional Evolutionary Approach (7th ed.). Brooks Cole.
4. Kardong, K. V. (2018). Vertebrates: Comparative Anatomy, Function, Evolution (8th ed.). McGraw-Hill Education.
5. Campbell, N. A., & Reece, J. B. (2019). Biology (11th ed.). Pearson.

## a. VIDEO RESOURCE

1. Khan Academy - Biology Playlist:  
[<https://www.youtube.com/playlist?list=PL3EED4C1D684D3ADF>](<https://www.youtube.com/playlist?list=PL3EED4C1D684D3ADF>)
2. Bozeman Science - Biology Playlist:  
[<https://www.youtube.com/playlist?list=PLIYOEFskp08dGf2L0xzaexUGh8OVGJtsM>](<https://www.youtube.com/playlist?list=PLIYOEFskp08dGf2L0xzaexUGh8OVGJtsM>)
3. The Science Asylum - Biology Playlist:  
[<https://www.youtube.com/playlist?list=PLsPUh22kYmNAmj5dz5sMdJppZ9o0BOA>](<https://www.youtube.com/playlist?list=PLsPUh22kYmNAmj5dz5sMdJppZ9o0BOA>)
4. PBS Eons - Evolution and Natural History Playlist:  
[<https://www.youtube.com/playlist?list=PLmnp7jsZr8DCVGe8gZoYeEqBdJl6jzeCb>](<https://www.youtube.com/playlist?list=PLmnp7jsZr8DCVGe8gZoYeEqBdJl6jzeCb>)
5. National Geographic - Animal Playlist:  
[<https://www.youtube.com/playlist?list=PLivjPDlt6ApTjurXykShuUqp7LQcj9s8s>](<https://www.youtube.com/playlist?list=PLivjPDlt6ApTjurXykShuUqp7LQcj9s8s>)

## b. WEB RESOURCES:-

1. Tree of Life Project: [<https://tolweb.org/tree/>](<https://tolweb.org/tree/>)
2. Encyclopedia of Life (EOL): [<https://eol.org/>](<https://eol.org/>)
3. Marine Biological Laboratory (MBL): [<https://www.mbl.edu/>](<https://www.mbl.edu/>)
4. ARKive - Discover the world's most endangered species: [<https://www.arkive.org/>](<https://www.arkive.org/>)
5. National Center for Biotechnology Information (NCBI): [<https://www.ncbi.nlm.nih.gov/>](<https://www.ncbi.nlm.nih.gov/>)

- c. **E-RESOURCES:-** Students may refer to e notes shared in their whatsapp group and the following e resources:



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1. PubMed Central (PMC):

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2. Google Scholar: [<https://scholar.google.com/>](<https://scholar.google.com/>)

3. ScienceDirect:

[<https://www.sciencedirect.com/>](<https://www.sciencedirect.com/>)

4. JSTOR: [<https://www.jstor.org/>](<https://www.jstor.org/>)

5. ResearchGate:

[<https://www.researchgate.net/>](<https://www.researchgate.net/>)