



# 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

**NAME OF THE DEPARTMENT:** Zoology

**NAME OF THE FACULTY:** Dr. Indumati Thakur

Dr. Anjana Verma

Dr. Rakhee Lohia

**ACADEMIC SESSION:** August 2022

**YEAR:** 2022

**PROGRAM:** B. Sc.

**SEMESTER:** VI

**COURSE TYPE:** DSE III

**COURSE:** FISH AND FISHERIES

**COURSE CODE:** DSE III

**TOTAL CREDIT:** 6 = (4 Theory, 2 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:** Understanding the types of cells, different types of cellular organization, and their complexities.

**CO2:** Aware of cellular compartmentalization, its functions, and its biological significance.

**CO3:** Understanding of cell division and its role in maintaining a stable genetic constituency, associated disease in cancer.



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**CO4:** Ability to distinguish between different types of cellular cross-talk and their role in structural and functional coordination.

**CO5:** They develop an appreciation for the biological functions at the cellular level and gets aware of their role in their day-to-day lives.

**CO6:** Aware of the associated diseases due to impaired physiology and able to design a healthy lifestyle for themselves and their loved ones.

## 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	-	1	-	-	-	-	3	3	-	-
CO2	3	2	2	2	-	1	-	-	-	3	3	3	-	-
CO3	3	3	3	3	-	2	1	-	2	2	3	3	3	1
CO4	3	2	2	2	-	2	-	2	-	3	1	2	1	-
CO5	-	-	-	-	-	2	-	-	-	3	-	2	2	-
CO6	2	-	-	-	-	-	-	-	3	3	-	2	2	2

1. Weak

2. Moderate

3. Strong

## Course teaching and learning activities

### B.PEDAGOGY

- Whiteboard
- Flipped Class
- PPT
- Debate
- Group Discussions

## B. COURSE COMPLETION PLAN

UNIT	NO. OF LECTURES			TEST	QUIZ	ASSIGNMENT
	THEORY	PRACTICAL	TUTORIAL			
1	7	7	-	1	1	-
2	14	14	-	1	1	-
3	10	10	-	1	1	-
4	8	8	-	1	1	-
5	13	13	-	1	1	-
6	7	7	-	1	1	-
7	2	2	-	1	1	-
8	6	6	-	1	1	-
9	2	2				



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## COURSE DELIVERY PLAN:

UNIT	TOPIC/SUBTOPIC	LECTURE REQUIRED	CO ADDRESSED	ASSIGNMENT /TEST/QUIZ
1	<b>Introduction and Classification</b> General description of fish; Account of systematic classification of fishes (upto classes); Classification based on feeding habit, habitat and manner of reproduction.	6	CO 1	1
2	<b>Morphology and Physiology:</b> Types of fins and their modifications; Locomotion in fishes; Hydrodynamics; Types of Scales, Use of scales in Classification and determination of age of fish; Gills and gas exchange; Swim Bladder: Types and role in Respiration, buoyancy; Osmoregulation in Elasmobranchs; Reproductive strategies (special reference to Indian fishes); Electric organs; Bioluminescence; Mechanoreceptors; Schooling; Parental care; Migration	18	CO 1, 2, 4, 5	2
3	<b>Fisheries</b> Inland Fisheries; Marine Fisheries; Environmental factors influencing the seasonal variations in fish catches in the Arabian Sea and the Bay of Bengal; Fishing crafts and Gears; Depletion of fisheries resources; Application of remote sensing and GIS in fisheries; Fisheries law and regulations	12	CO 2, 4, 5, 6	1
4	<b>Aquaculture</b> Sustainable Aquaculture; Extensive, semi-intensive and intensive culture of fish; Pen and cage culture; Polyculture; Composite fish culture; Brood stock management; Induced breeding of fish; Management of finfish hatcheries; Preparation and maintenance of fish aquarium; Preparation of compound diets for fish; Role of water quality in aquaculture; Fish diseases: Bacterial, viral and parasitic; Preservation and processing of harvested fish, Fishery by-products	20	CO 5, 6	2
5	<b>Fish in research</b> Transgenic fish, Zebra fish as a model organism in research	4		





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## C. SUGGESTED READINGS

### a. TEXT BOOKS

### b. REFERENCE BOOKS

- i. Q Bone and R Moore, Biology of Fishes, Talyor and Francis Group, CRC Press, U.K.
- ii. D. H. Evans and J. D. Claiborne, The Physiology of Fishes, Taylor and Francis Group, CRC Press, UK von der Emde, R.J. Mogdans and B.G. Kapoor. The Senses of Fish: Adaptations for the Reception of Natural Stimuli, Springer, Netherlands
- iii. C.B.L. Srivastava, Fish Biology, Narendra Publishing House
- iv. J.R. Norman, A history of Fishes, Hill and Wang Publishers
- v. S.S. Khanna and H.R. Singh, A text book of Fish Biology and Fisheries, Narendra Publishing House

### c. VIDEO RESOURCE

### d. WEB RESOURCES:-

### e. E-RESOURCES