

# **Course Outcome**

## **Department of Science**

### **Subject: Zoology**

### **B. N. M. College, Barhiya**

*22/07/22*



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## **B. Sc. Part - I:- ZOOLOGY (HONOURS)**

### **PAPER-IA**

#### **(Non-Chordate)**

CO 1- Explain and able to distinguish the characteristic features of each phylum like Protozoa, Porifera, Cnidaria, Ctenophora, Platyhelminthes, Aschelminthes, Annelida, Arthropoda, Mollusca, Echinodermata and Hemichordate

CO 2 - Understand and describe the classification concepts of nonchordates.

CO 3- Classify, Identify and recall the name and distinct features of nonchordates.

CO 4 - Explain, and relate the origin, structural organization and evolutionary aspects of invertebrates. Analyze, compare and distinguish the developmental stages and describe the important biological process.

CO 5 - Understand and critique the economic importance of nonchordates.

CO 6 - Illustrate and examine and compare the systemic and functional morphology of various group of non chordates

CO 7- Compare and distinguish the general and specific characteristics of reproduction in lower animals

CO 8- Infer and integrate the parasitic and economic importance of non chordate animals

CO 9- Understand the interaction of nonchordates with the environment

### **PAPER-IIA**

#### **(Ecology, Animal Behaviors and Biometry)**

CO1- Recall the procedure for the estimation of abiotic factors and list out the identification characters of organisms.

CO2- Estimate various parameters of water and collection and of organisms belonging to different habitats.

CO 3- Illustrate abiotic/biotic interactions and symbiotic relationships

CO 4- Analyse and interpret the impact of lifestyle on the environment.



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CO 5- Understand global environmental issues as climate change carbon footprint water security and population biology.

CO 6- Summarize the abundance and distribution of organisms.

CO 7- Bring awareness about the impact of socio-economic development on the environment and the solutions put forward by the government to reduce environmental damage.

CO 8-Discuss the environmental hazards and social and economic ramifications.

CO 9- Recall the basics of animal behaviour, ethology patterns of behaviour and approaches and methods in the study of behaviour.

CO 10- Describe and compare social behaviour reproductive behaviour

CO 11- Learn the origin and development of animal behaviour and to understand the influence of genetics, environment on animal behaviours.

CO 12- Understand the biological properties of animal behavior, with an evolutionary and ecological emphasis.

CO 13-Compare innate and learned behavior and differentiate between various mating system.

CO 14- Impart the knowledge about visual and auditory communication; courtship, mate choice, and mating systems; social behavior and social systems; and animal personality.

CO 15- Discuss how movement and migration behaviors are a result of natural selection

CO 16- Illustrate ecological aspects of behaviour which includes habitat selection, optimal foraging theory and aggressive behaviour.

CO 17-Understand and explain courtship and parental behaviour evolution of sex and reproductive strategies.

CO 18- Calculate numerical of mode, median and arithmetic mean, standard error, standard deviation, Simple test and Chi-square test using formula

CO 19- Understand and recall the basic concepts of biometry.

CO 20- Apply suitable statistical methods to solve problems.

CO 21-Identify and relate the statistical principles for the application of biological experiments

CO 22-Integrate the statistical methods to validate research investigations

## **PRACTICAL PAPER**

### **IB and IIB**

CO1- Gain Basic knowledge on handling animals like Pheretima, Leech, Palaemon, Unio, Pila and Sepia and dissection

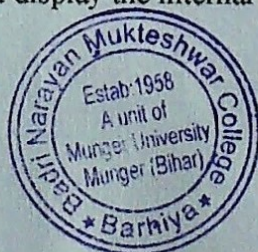
CO2- Identify the different groups of nonchordates animals by observing their external characteristics.

CO 3- Understand the organs, organ system and their functions in lower animals.

CO 4- Get knowledge about the different modes of life and their adaptation based on the environment.

CO 5- Able to dissect and display the internal organs and mount the mouthparts and scales of

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lower animals.

CO 6- Understand the basic structure on invertebrate animals through dissection

CO 7- Acquire knowledge of the reproductive system, nervous system, excretory system and respiratory system of animals like Pheretima, Leech, Palaemon, Unio, Pila and Sepia.

CO 8- Prepare and develop the mounting procedure of Paramoecium gemmules, Spicules, obelia colony, Nephridia and Ovary of Pheretima Jaw of Leech, statocyst of prawn, osphradium, radulla and gill of pila of unio, Glochidium larva, of crustace and Echinoderma, Pediceralia

## **B. Sc. Part - II:- ZOOLOGY (HONOURS)**

### **PAPER-III**

#### **(Chordata)**

CO1- Understand and describe general features of phylum chordata

CO2- Classify, Identify and recall the name and distinct features of chordates such as Protochordata, Cyclostomata, Pisces, Amphibia, Reptilia, Aves & Mammalia.

CO3- Understand and able to distinguish the characteristic features of each subphylum and class

CO4- Analyze, compare and distinguish the developmental stages of chordates and describe the important biological process

CO 4- Understand the economic importance of vertebrates.

CO 5- Understand and critique the economic importance of chordates.

CO 6- Illustrate and examine and compare the systemic and functional morphology of various group of chordates

CO 7- Compare and distinguish the general and specific characteristics of reproduction in chordates

### **PAPER-IV**

#### **(Comparative Anatomy, Embryology)**

CO1- Understand and correlate the significance of cellular processes in embryonic development and specifically in organogenesis.

CO2- Describe and elaborate on the involvement of specific cell types in the formation of specific organs and explain the importance of morphogens.

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CO3- Help students to distinguish between the different types of developmental mechanisms in various organisms.

CO 4- Help students to understand the role of environment and genetics in influencing embryonic development

CO 5-Understand artificial reproductive technologies and uncovers the causes and consequences of multiple births, conjoined babies and congenital disorders to help the students to correlate the significance of cellular processes in organogenesis.

CO 6- Understand the organ systems such as Integument,its derivatives and function, Evolution and fate of kidney, urinogential ducts, gonads,Evolution of chondro-Splanchno & osteocranium in the vertebrate groups

CO 7- Will get knowledge about Gastrointestinal tract, Respiratory systems,Heart, Aortic arches,Brain

CO 8- Will differentiate and compare the different type of excretion and kidney

### **B. Sc. Part – III - ZOOLOGY (HONOURS)**

#### **PAPER-V**

##### **(Biochemistry, Physiology & Endocrinology)**

CO1-Students will understand the structure and classification of Amino Acids, Protein, Carbohydrate & fats

CO 2-Will get the knowledge about the different types of Vitamins and their role in the metabolism as coenzymes

CO 3-Will able to describing structure, functions and the mechanism of action of enzymes.

CO 4-Will develop the knowledge about the mechanism or working of body, its systems, its tissues, the cells and the biomolecules.

CO 5-Will get deeper insight about the structures and function of endocrine glands and get an understanding of the common endocrine.

#### **PAPER-VI**

##### **(Cell Biology, Genetics and Economic Zoology)**

CO1- Students will get the understanding of fundamental principles cellular biology

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CO2-Will learn the structure and functions of a living cell and importance of genetics plays in organic evolution, adaptation and genetic disorders.

CO3-Will able to develop relationship between cell structure cell functions

CO4-Will learn how cells grow, divide, and die and their regulation process

CO 5-Will get the knowledge about cell signaling and regulation of cellular functions. Students will also learn about the cancer and other diseases.

### **PRACTICAL ZOOLOGY (Practical)**

#### **PAPER VIIIA**

#### **(Biochemistry, Physiology & Endocrinology)**

CO1-Dissection and display of gonad, thyroid, adrenal, Pancreas in mammal

CO 2-Determine the bleeding and clotting time

CO 3-Estimation of haemoglobine (gm/ 100 ml) in blood.

CO 4-Enunmeration of total RBC.

CO 5-Student weill experiment Benedicts test for reducing sugar, Molisch's test, Iodine test for starch and glycogen

#### **PAPER – VIIB**

#### **(Cell Biology, Genetics, Paleozoology and Evolution)**

CO 1-Able to do vital staining of secretary granules in Salivary glands of Cockroach and Mitochondria in the buccal epithelium.

CO 2- Homology and Analogy as exhibited by the wings of birds, bat and insect.

CO 3-Explain the adaptive radiation as exhibited by beaks of birds and dentition of mammals.

CO 4-Demonstrate stages of mitotic and meiotic divisions respectively.

CO 5-Able to do preparation of the giant chromosomes of the chironomus/drosophila larvae.



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CO 6-Explain Serial homology in the appendages of prawn.

**PAPER -VIII B**

**(Ecology, Animal Behaviour, Palaeozoology, Zoogeography & Economic Zoology)**

CO 1-Student will able to understand the concept of biosphere

CO 2-Will get the knowledge about the functioning and energy flow of ecosystem

CO 3-Will be able to analyze the behavior of fishes, insects and migratory birds

CO 4-Will get the knowledge about the economic importance of sericulture

CO 5-Will understand the importance of pests and vector control

CO 6-Student will able to determine the DO concentration and pH of water sample

CO 7-Will be able to evaluate the moisture content of soil

CO 8-Will able to identify the organisms present in water soil samples

CO 9-Will understand the Economic importance of silk worm, lac worm and honey bee

CO 10-Will get the knowledge about development stages of Lac sticks, Lac insect, fishing gears and sand fly, honey, propolis

CO 11-Compare homology and analogy

CO 12-Will able to make permanent slide of insect mouth parts

*P. B. K. Mondal*



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