

Shri Shivaji Science and Arts College, Chikhli.
Department of Zoology
Program Outcome, Program Specific Outcome and Course Outcome

Program Outcome

B.Sc. in Zoology is an undergraduate Program in Zoology. Zoology is the branch of science which deals with the study of animal kingdom including the evolution, structure, Physiology, Classification, developmental biology, habits, habitat and distribution of all the animals. The B.Sc. Zoology course is premeditated to introduce students to the study of zoology at the organism and organ function levels. The program provides the student with an introduction to the recent advances in zoology in the areas of systematic, evolution, reproduction, development, animal diversity, cytology, molecular biology and animal ecology. This course is offered for candidates who are interested in the study of animals. The minimum time required to complete the course is three years.

Programme Specific Outcomes: B. Sc. Zoology

1. Identify and become familiar with the scope, methodology and application of modern zoology.
2. Demonstrate a broad understood of animal diversity, including knowledge of the scientific classification and evolutionary relationships of major groups of animals.
3. Characterize the biological, chemical, and physical features of environments (e.g., terrestrial, freshwater, marine, host) that animals inhabit. Explain how animals function and interact with respect to biological, chemical and physical processes in natural and impacted environments.
4. Perform laboratory procedure with suitable techniques in Histology, Physiology, Genetics, Cytology, Molecular Biology and environmental biology
5. Explain how organisms function at the level of the gene, genome, cell, tissue, organ and organ-system. Drawing upon this knowledge, they are able to give specific examples of the physiological adaptations, development, reproduction and behavior of different forms of life.
6. Understand the applied biological sciences or economic Zoology such as Vermiculture, Sericulture, Apiculture, Aquaculture and Immunology to empower the students.

Course specific outcome

B.Sc. I - SEM – I

Course - Life and Diversity of Non-Chordata.

After successfully completing this course, students will be able to:

CO1. State the outline of animal classification of non-chordates

CO2. Knowledge about protozoal human diseases.

CO3. Describe the morphology, habit and habitat. Systematic position and various systems
In Sycon and Metridium

CO4. Describe the morphology, habit and habitat. Systematic position and various systems
In Fasciola and Ascaris.

CO5. Describe the morphology, habit and habitat. Systematic position and various systems
In Leech and Cockroach.

CO6. Describe the morphology, habit and habitat. Systematic position and various systems
In Pila and Asterias.

CO7. Describe the morphology, habit and habitat. Systematic position and various systems
In Fasciola and Ascaris.

- CO8.** Describe body organization and affinities of Balanoglossus.
- CO9.** Explain Structure and importance of coral reefs.
- CO10.** Explain Parasitic Adaptations in helminthes and larval forms of Non-chordates.
- CO11.** List of ten invertebrate phyla

Course Outcome

B.Sc. I SEM – II

Course – Cell and Developmental Biology

After successfully completing this course, students will be able to:

- CO1.** Differentiate prokaryotic and Eukaryotic cells.
- CO2.** Describe the structure and functions of Endoplasmic reticulum.
- CO3.** Describe various Structural models of Plasma membrane with its function
- CO4.** Describe the structure and functions of Golgi complex, Ribosome, Mitochondria and Lysosomes
- CO4.** Explain the structure and functions of Nucleus, typical chromosomes and Giant chromosomes.
- CO5.** Explain the cell division process and its significance.
- CO6.** Describe the process of Gametogenesis.
- CO7.** Explain the types and Mechanism of fertilization.
- CO8.** Describe development up to Coelom formation in Amphioxus
- CO9.** Explain development up to Gastrulation in frog and chick.
- CO10.** Describe the development of extra embryonic membranes in chick
- CO11.** Explain the various types of placenta in mammals.
- CO12.** Describe parthenogenesis and regeneration in animals.
- CO13.** Give elementary idea of Stem cells.

B.Sc. I - SEM – I

Course: Life and Diversity of Non-chordate. (Practical in Zoology)

After successfully completing this course, students will be able to:

- CO1.** State outline classification of non-Chordate.
- CO2.** List of ten invertebrate phyla.
- CO3.** Enlist the various animals belonging to different phyla.

CO4. To know the structures of various organs of non chordate animals.

CO5. To understand the Anatomy of leech and cockroach.

CO6. To prepare permanent slides.

B.Sc. I - SEM – II

Course: Cell and Developmental Biology. (Practical in Zoology)

After successfully completing this course, students will be able to:

CO1. Use of Microscope.

CO2. Prepare gram staining.

CO3. To prepare slides of polytene chromosomes.

CO4. To prepare slides of various stages of Mitosis and Meiosis.

CO5. Identify the stages of Gametogenesis in rat

CO6. Identify the different type's animal eggs.

CO7. To explain the life cycle of Cockroach, housefly, mosquito and butterfly.

CO8. To demonstrate chick development.

CO9. To identify developmental stages of frog and chick.

CO10. To know the structure of placenta in mammals.

B.Sc. II- SEM – III

Course -Life and Diversity of Chordata and Concept of Evolution

CO1. To state the classification of chordata.

CSO2. Classify phylum Protochordates to Class-Mammalia

CO3. Students acquires anatomical knowledge of Amphioxus, Scoliodon, Frog, Calotes and Pigeon

CO4. Gain knowledge of anatomy of vertebrates from Protochordates to Class Mammalia

CO5. Impact knowledge of evolutionary processes ex. Darwinism, Lamarkinism, Speciation

CO6. Understand the co-relation among animal species.

CO7. Understand the Human Evolution

CO8. Gain knowledge and Understanding of protection of endangered species, biodiversity, environmental conservation processes and its importance.

B.Sc. II- SEM –IV

Course- Advanced Genetics and Animal Ecology

CO1: Gain Mendelian and Non- Mendelian inheritance

CO2: To understand theories of sex determination

CO3: Understand Human Genetical Disorders

CO4: Gain knowledge of Genetic Screening and prenatal diagnosis

CO5: Gain knowledge of Abiotic and Biotic factor

CO6: Understand different ecosystem and relationship between habit and ecological niche.

B.Sc. II- SEM – III

Course -Life and Diversity of Chordata and Concept of Evolution (Practical)

After successfully completing this course, students will be able to:

CO 1. To state the classification of Chordata.

CO 2. To understand the anatomy through video, Models , Photographs

CO 3. Gain knowledge of bones of fowl and rabbit

CO 4. Gain knowledge of fossils and living fossils

CO 5. Study of evolution of beaks and leg of birds

CO 6. To know the histology of Amphioxus and frog.

B.Sc. II- SEM –IV

Course_ Advanced Genetics and Animal Ecology (Practicals)

After successfully completing this course, students will be able to:

CO1.Recording of Mendelian Traits in Man

CO2. Detection of Monohybrid and Dihybrid Cross

CO3. To identify human Karyotype and Chromosomal syndrome from photo slide.

CO4. To record human genetically traits.

CO5. To Estimate of DO, Salinity, PH, free CO₂, Calcium, Carbonates, Bicarbonates.

CO6. To Prepare field Report. Food Web diagram and Identification of common Animals

B.Sc. III - SEM – V

Course – Animal Physiology and Economic Zoology.

After successfully completing this course, students will be able to:

- CO1. Describe the Structure of respiratory organ.
- CO2. Explain the physiology of respiration and respiratory pigment.
- CO3. Neurophysiologic control of respiration.
- CO4. Describe blood circulation and its types.
- CO5. Explain the structure and mechanism of heart.
- CO6. Describe blood groups, blood coagulation, and factors.
- CO7. Explain the types and structure of muscles.
- CO8. Describe the physiology of muscle contraction.
- CO9. Explain the structure and types of neuron.
- CO10. Describe the neurotransmitter, synapse and synaptic transmission.
- CO11. Explain the hormones and their physiological role.
- CO12. Describe the reproductive cycle and hormonal control of reproduction.
- CO13. Explain the osmoregulation in aquatic and terrestrial animals.
- CO14. Describe the beneficial and harmful insects.
- CO15. Present status of aquaculture in India and fresh water fish culture.

B.Sc. III - SEM – VI

Course – Molecular Biology and Biotechnology.

After successfully completing this course, students will be able to:

- CO1. To prove the genetic material by various experiment.
- CO2. Explain the chemical structure and types of DNA and RNA.
- CO3. Describe the semi-conservative replication of DNA.
- CO4. State the concept of genes.
- CO5. Describe the process of protein synthesis.
- CO6. Explain the gene regulation in *E. Coli*.
- CO7. Describe the theory, types and significance of mutation.
- CO8. Explain the DNA repair process.
- CO9. Describe the PCR and blotting technique.
- CO10. State the DNA finger printing.
- CO11. Explain the recombinant DNA technology and its practical application.
- CO12. Describe the immune system and its types.
- CO13. To state the humoral and cell mediated immunity.

CO14. To know the ELIZA and RIA technique.

B.Sc. III - SEM – V

Course – Animal Physiology and Economic Zoology. (Practical in Zoology)

After successfully completing this course, students will be able to:

CO1. Detection of blood groups.

CO2. Estimation of hemoglobin percentage.

CO3. RBC and WBC count.

CO4. Preparation of haematin crystals.

CO5. Measurement of blood pressure.

CO6. To demonstrate action of salivary amylase on starch.

CO7. To detect nitrogenous waste product.

CO8. To explain the life cycle of honey bee, lac insect and silk moth.

CO9. To identify the histological slides of major organs of respiratory, circulatory and nervous system.

CO10. To know the locally available fishes.

B.Sc. III - SEM – VI

Course – Molecular Biology and Biotechnology. (Practical in Zoology)

After successfully completing this course, students will be able to:

CO1. To state the scope and importance of Microtechnique.

CO2. To prepare the various fixative.

CO3. To know the collection of various tissue.

CO4. To prepare the alcoholic grades.

CO5. Use and care of oven.

CO6. To know the block making and trimming.

CO7. Use and care of microtome.

CO8. To know the section cutting and staining technique.

CO9. To prepare the various stains.

CO10. To know the camera Lucida and its use and drawings.

CO11. To prepare the slide of mitochondria.

CO12. To know the extraction of DNA.

CO13. Explain the application of DNA finger printing