

Department of Zoology

Program Outcomes, Program Specific Outcomes and Course Outcomes of

F. Y. / S. Y. B. Sc. in Zoology

B. Sc. (Zoology) Programme

Zoology is one of the major subjects of Basic Sciences and deals with all aspects of animal biology. It includes an interesting range of highly diverse topics. A zoology student needs to gain understanding of many areas of the subject to keep pace with advancements in Life Sciences. This under-graduate degree program has been designed by the Board of Studies in Zoology of Savitribai Phule Pune University with a substantial component of what is needed from zoologists as a skilled career and what zoologists need to pursue for post-graduation and further academic studies. It follows the guidelines laid down by the University Grants Commission, New Delhi. This newly designed curriculum is a perfect blend of the classical aspects in Zoology and the advanced and more specialized areas. This degree offers Discipline Specific Core Courses [CC] in Animal Systematics, Animal Ecology, Animal Cell biology, Applied Zoology, Pest Management, Histology, Biological Chemistry, Genetics, Developmental Biology, Parasitology, Medical & Forensic Zoology, Animal Physiology, Molecular Biology, Entomology, Techniques in Biology and Evolutionary Biology. In addition to the Core Courses, Ability Enhancement Compulsory Courses [AECC] have been added in the second year i.e. Semester III and Semester IV of the undergraduate course. In the third year i.e. Semester V and Semester VI, Discipline specific Elective Courses [DSEC] and Skill Enhancement Courses [SEC] have been offered. The students, therefore, have an opportunity to take courses in Environment Awareness, Language communication: English/Marathi, Aquarium Management, Poultry Management and Environmental Impact Assessment. In Semester VI the students also have a course dedicated to Project work. The syllabus has been framed in such a way that the student gains each year, a broader perspective of the subject as he progresses towards completion of the degree program. Field trips, Educational visits and the Project work have been included for the student to experience the applications of the theory learnt in the classroom. After completion of the program, it is expected that students will understand and appreciate: animal diversity, few applications of Zoology, the structure, functions and life processes at cellular, tissue, organ and system level, significance of evolution, and basic concepts of human health. The students would also gain an insight into laboratory and field work through the practical course, field work and the project.

The new course that will be effective from the academic year 2019- 2020 and will follow the Choice Based Credit System in a Semester mode. It has been primed keeping in view the distinctive requirements of B. Sc. Zoology students. The contents have been drawn-up to accommodate the widening prospects of the discipline of Life Sciences. They reflect the changing prerequisites of the students. This program has been introduced with 132 credits for the subject group while 08 credits to earn from any of the 08 groups offering a range of curricular, curricular and extracurricular activities. This pattern has been specially aimed towards the overall development of the students'. The calculation of credits and CGPA will be as per the guidelines of the University. The B. Sc. Zoology program provides an appropriate blend of classical and applied aspects of the subject. This newly designed curriculum will allow students to acquire the skill in handling scientific instruments planning and performing in the laboratory and exercising critical judgement, independent thinking and problem solving skills.

Aim:

1. To foster curiosity in the students for Zoology
2. To create awareness amongst students for the basic and applied areas of Zoology
3. To orient students about the importance of abiotic and biotic factors of environment and their conservation.
4. To provide an insight to the aspects of animal diversity.
5. To inculcate good laboratory practices in students and to train them about proper handling of lab instruments

Objectives:

Imparting quality education in Zoology has been the focus of the department right from its inception. Emphasis is given on education both within and outside the classroom.

The Department is dedicated to fulfill the following objectives through the curricular and curricular activities:

- To provide students with knowledge of fundamental principles in zoology that will provide a foundation for their later advanced course in more specific biological subjects.
- To make students familiar with animal classification schemes and other applied courses as well as developing an understanding of and ability to apply basic zoological principles.
- To integrate the laboratory and lecture sections of the course and directed toward teaching students both in the classroom and on the field.
- To provide quality education offering skill based programs and motivate the students for self-employment in applied branches of Zoology.
- To inculcate the value based education and entrepreneurial skills among the students.
- To create awareness on environmental issues through various activities.

Programme Outcomes:

After successfully completing **B. Sc. (Zoology)** Programme students will be able to:

- PO1.** Communicate scientific information through effective formal and informal methods generally used in sciences.
- PO2.** Conduct basic scientific research and provide inputs for societal benefits.
- PO3.** Develop competence in basic sciences and in the content of the specific courses
That constitutes the principal knowledge of their degree.
- PO4.** Compare and contrast the characteristics of animals that differentiate them from other forms of life.
- PO5.** Acquire the skills in handling scientific instruments, planning and performing in laboratory experiments.
- PO6.** Understand and be aware of relevant theories, paradigms, concepts and principles of zoology.
- PO7:** Understand the structure and functions of cell types
- PO8:** Acquire time management and self-management skills.
- PO9:** Relate the various abiotic factors with health of living forms and ecosystems.
- PO10:** Explain the role of various biomolecules in living systems
- PO11:** Apply the knowledge of Zoology to understand the complex life Processes and phenomena.
- PO12:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning.

Programme Specific Outcomes

- PSO1.** Ability to connect and apply biological knowledge to other disciplines and to integrate knowledge into their personal and professional lives.
- PSO2.** Explain the origin of life with context to the origin of eukaryotic cell and endosymbiotic theory of origin. Fossil records, Darwinism and Neo-Darwinism, experimental evidences.
- PSO3.** Illustrate zoological science for its application in branches like medical entomology, apiculture, aquaculture and agriculture etc
- PSO4.** Understand animal interactions with the environment and identify the major groups of organisms with an emphasis on animals and classify them within a phylogenetic framework.

Course Outcomes

B. Sc. (Zoology) First Year B.Sc.

Semester I

Course Title: Animal Diversity –I Course Code-ZO-111 Semester I (2 credits-30 lectures)

1. To understand the Animal diversity around us.
2. To understand the underlying principles of classification of animals.
3. To understand the terminology needed in classification.
4. To understand the differences and similarities in the various aspects of classification.
5. To classify invertebrates and to be able to understand the possible group of the invertebrate observed in nature.
6. To understand our role as a caretaker and promoter of life.

Course Title: Animal Ecology Course Code: ZO 112 Semester I (2 Credits-30 Lectures)

1. The learners will be able to identify and critically evaluate their own beliefs, values and actions in relation to professional and societal standards of ethics and its impact on ecosystem and biosphere due to the dynamics in population.
2. To understand anticipate, analyse and evaluate natural resource issues and act on a lifestyle that conserves nature.
3. The Learner understands and appreciates the diversity of ecosystems and applies beyond the syllabi to understand the local lifestyle and problems of the community.
4. The learner will be able to link the intricacies of food chains, food webs and link it with human life for its betterment and for non-exploitation of the biotic and abiotic components.
5. The working in nature to save environment will help development of leadership skills to promote betterment of environment.

Course Title: Zoology Practical Paper Course Code: ZO113 Semester I (1.5 Credits-45 Hours)

1. To understand the Animal diversity around us.
2. To understand the underlying principles of classification of animals.
3. To understand the terminology needed in classification.
4. To understand the differences and similarities in the various aspects of classification.
5. To classify invertebrates and to be able to understand the possible group of the invertebrate observed in nature.
6. To understand our role as a caretaker and promoter of life.
7. The learner will understand the importance of cell as a structural and functional unit of life.
8. The learner understands and compares between the prokaryotic and eukaryotic system and extrapolates the life to the aspect of development.
9. The dynamism of bio membranes indicates the dynamism of life. Its working mechanism and precision are responsible for our performance in life.
10. The cellular mechanisms and its functioning depend on endo-membranes and structures. They are best studied with microscopy

Semester II

Course Title: Animal Diversity –II Course Code: ZO-121: Semester II (2 credits-30 lectures)

1. To understand the Animal diversity around us.
2. To understand the underlying principles of classification of animals.
3. To understand the terminology needed in classification.
4. To understand the differences and similarities in the various aspects of classification.
5. To classify invertebrates and to be able to understand the possible group of the invertebrate observed in nature.
6. To understand our role as a caretaker and promoter of life.

Course Title: Cell biology Course Code: ZO122: Semester II (2 credits-30 lectures)

1. The learner will understand the importance of cell as a structural and functional unit of life.
2. The learner understands and compares between the prokaryotic and eukaryotic system and extrapolates the life to the aspect of development.
3. The dynamism of bio membranes indicates the dynamism of life. Its working mechanism and precision are responsible for our performance in life.
4. The cellular mechanisms and its functioning depend on endo-membranes and structures. They are best studied with microscopy

Course Title: Zoology Practical Paper Course Code: ZO123 Semester II (1.5 Credits-45 Hours)

1. To understand the Animal diversity around us.
2. To understand the underlying principles of classification of animals.
3. To understand the terminology needed in classification.
4. To understand the differences and similarities in the various aspects of classification.
5. To classify invertebrates and to be able to understand the possible group of the invertebrate observed in nature.
6. To understand our role as a caretaker and promoter of life.
7. The learner will understand the importance of cell as a structural and functional unit of life.
8. The learner understands and compares between the prokaryotic and eukaryotic system and extrapolates the life to the aspect of development.
9. The dynamism of bio membranes indicates the dynamism of life. Its working mechanism and precision are responsible for our performance in life.
10. The cellular mechanisms and its functioning depend on endo-membranes and structures. They are best studied with microscopy

B. Sc. (Zoology) Second Year B.Sc.

B. Sc. (Zoology) Second Year B.Sc.

Course ZY 211-Animal Systematics and Diversity III.

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

- 1: List the various animals in a given phylum of invertebrates
- 2: Identify various larval stages and development in invertebrate groups
- 3: Explain various modifications in these groups and the need of the modification for survival.
- 4: Explain various adaptations in insects including mimicry and metamorphosis
- 5: Describe the morphology, habit and habitat, systematic position and various systems in Star fish.
- 6: State the outline of animal classification of non-chordates
- 7: Classify the higher invertebrate groups.
- 8: Categorize the diversity found in the invertebrate groups of animals like Arthropoda, Mollusca and Echinodermata.

Course ZY 212: Applied Zoology I

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

- 1: Define the concepts of the applied subjects like Fisheries, Aquaculture and Pest Control.
- 2: Identify freshwater, marine water fishes.
- 3: Explain the tools and techniques used in aquaculture and agricultural practices.
- 4: Describe the fish species commonly used in fishery business.
- 5: Describe the common agricultural pests from nearby area.
- 6: Illustrate the diseases in aquaculture and agriculture.
- 7: Classify freshwater and marine water fishes.
- 8: Categorize economically important fish species.

Course ZY 221-Animal Systematics and Diversity IV.

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

- 1: List the various vertebrate animals in a given class.
- 2: Identify poisonous and non-poisonous snakes.
- 3: Explain various modifications in the given group of animals.
- 4: Explain various adaptations in avian group as well as migration and flight in birds.
- 5: Describe the morphology, habit and habitat. Systematic position and various systems in *Scoliodon*.
- 6: State the outline of chordate classification.
- 7: Classify the higher vertebrate groups.
- 8: Categorize the diversity found in the vertebrate groups of animals like reptiles, birds and mammals.

Course ZY 222: Applied Zoology II

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

- 1: Define the concepts of the applied subjects like Apiculture and Sericulture.
- 2: Identify different species and casts of honeybees and species of silkworm.
- 3: Explain the tools and techniques used in apiculture and sericulture.
- 4: Explain the important pests of apiculture and sericulture.
- 5: Describe the economic importance of honeybee and silkworm.
- 6: Illustrate management of the apiary and sericulture units.
- 7: Classify of *Apis*, *Bombyx* and *Anthereria*.

8: Select economically important species of *Apis* for unifloral and multifloral honey production.

Course ZY 223: Practicals in Zoology:

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

- 1: Identify animals of higher groups in Invertebrates and Vertebrates. 2: Distinguish between poisonous and non-poisonous snakes
- 3: Label various parts of the animals and their modifications
- 4: Observe the various tools, crafts and gears used in Apiary, Fishery, Sericulture and Pest control.
- 5: Identify the pests in agriculture and enemies in Apiary
- 6: Explain the modifications and adaptations in animals
- 7: Explain the use of tools in Apiary, Sericulture and appliances in Pest control.
- 8: Describe External features and economic importance of freshwater and Marine water fishes and other aquaculture organisms
- 9: Describe the morphology, habit and habitat. Systematic position and various systems in starfish and *Scoliodon*