

# ZOOLOGY DEPARTMENT

**Table 2: Course Outcomes, Program: B. Sc Zoology (General), Program code: ZOOG**

S.L. No	Course	Semester	Course Code	Credit	Marks	Course outcome	Skill Development related to employability and Entrepreneurship development
1	Animal Diversity (theory)	1	ZOOG-CC-1-1-TH	4	70	<p>After completion of this course, students will have knowledge of different major taxa in animal kingdom and several of their biological functions.</p> <p>Understanding of animal classifications along with their biology, will lucid the path of further studying in biological sciences.</p>	<p>The course focuses to develop the basic knowledge in animal diversity. The basic knowledge and conception of this field will paly a pivotal role during higher level courses in biology and zoology. The content of course is also important to qualify the NET, SET, GATE and other job oriented examinations and interviews for Bio-science students.</p>
2	Animal Diversity (Practical)	1	PHS-G-CC-1-1-P	2	30	<p>Identification of representative samples, belonging to different taxa that have been studied in theory classes are there. Also difference between poisonous vs non-poisonous snakes and anatomy of Cockroaches that includes salivary glands, mouth parts, digestive system and female reproductive system.</p>	<p>This is an enormous criterion for a biologist to identify animals properly, both at field and museum. Studying preserved specimen will help them to build skills for both. Identifying venomous snakes is not only important for saving human but also is necessary to prevent un necessary killing of non-venomous snakes. Basic idea on practical knowledge of anatomical features will help students to have an idea about basic body plan of animals.</p> <p>Several natural history museums all over world and Zoological Surveys of several countries need efficient taxonomist to identify and curate preserved zoological specimens.</p>
3	Comparative Anatomy and Developmental Biology (theory)	2	ZOOG-CC-2-2-TH	4	70	<p>This course will help students to understand the structural organization of animals and how they develop. While the first part will help building understanding of how different structural organization have gradually modified over time in different animal taxa, the later will build concept of how a single cell slowly forms a multi-cellular organism with versatile types of cells and tissues.</p>	<p>Basic knowledge of biological structural organization is of huge importance to carry on further studies in Zoology. Without understanding how they develop, we might fail to understand how biological systems work and how they fail to work. The content of course is also important to qualify the NET, SET, GATE and other job oriented examinations and interviews for Zoology students.</p>

4	Comp. Ana. and Dev. Bio (practical)	2	ZOOG-CC-2-2-P	2	30	After completion of this course students will learn about the structural aspects of bones, larval features of some invertebrate taxa and developmental stages of chick embryo. Also histological sections of different types of placenta are there.	Comparing bones from different vertebrates will also lead to a clear view about how structural parts have been developed and changed gradually over time. Different stages of invertebrate Larvae and chick embryo, also elucidate how slowly animal body plan have been modified both due course of time. These knowledge are not only helpful to build ideas rather will be crucial to develop experimental aptitude in future higher study.
5	Physiology and Biochemistry (Theory)	3	ZOOG-CC-3-3-TH	4	70	This course will help students to build knowledge on functional edifices of biological systems, like: how different organs do function and how do they maintain integrity inside our body. Also they will learn about metabolism that is essential for production of energy and functional components.	The basic knowledge in this course will enable students to learn how an animal body does functions. What condition could be normal and how can they be identified as not normal or sometimes ill. Understanding of this course is required, later in this course during studying medical diagnosis, too. The content of course is also important to qualify the NET, SET, GATE and other job oriented examinations and interviews for bio-science students.
6	Physiology and Biochemistry (practical)	3	ZOOG-CC-3-3-P	2	30	Students will study different histological sections of mammalian endocrine glands and several important organs like liver/lung/kidney. Also hands on experiences on quantitative tests for carbohydrate samples.	This course work will help students to understand how in reality our body organs look like at their tissue level. They will have hands on experience in biochemical tests that might be helpful in their future job prospects as bio-medical technician.
7	Apiculture (Theory)	3	ZOOG-SEC-A-3-1-TH	2	100	This course will let the students to have the idea of culturing and maintenance of Bees, how to harvest bee products like honey, wax ... How to check bee disease and prevention.	This course will enable students to create entrepreneurship in Apiculture (Bee culture). Interested students can take initiative to open their own start up of bee farming and bee-products production. Also it will enable them to answer many question in competitive exams related to animal husbandry.
8	Genetics and Evolutionary Biology (Theory)	4	ZOOG-CC-4-4-TH	4	70	Students will mostly learn about Mendelian transmission genetics and linkage and crossing over phenomena and also genetics of sex determination in <i>Drosophila</i> . Basic idea about chemical origin of life and evolutionary theories, process and mechanisms.	Knowledge in this field is required to understand the basic controlling factors of life like how genes do influence phenotypes and how variation in genes are affected by natural factors. This will lead students to understand how natural selection works to shape phenotypic variation in animal kingdom. The content of course is also important to qualify the NET, SET, GATE and other job oriented examinations and interviews for bio-science students.

8	Genetics and Evolutionary Biology (Practical)	4	ZOOG-CC-4-4-P	2	30	Students will have basic idea about using statistical tests of significance (chi square test). They will study aneuploidy in human, phylogeny of horse and variations in Darwin's finches. Also they have an educational tour to natural history museum that will enrich their theoretical knowledge with practical and real life experiences.	Importance of statistical data analyses and hypothesis testing is without question a desirable character in today's world. Students will have a by hand experience by their own through this course. Knowledge about phylogeny and experiences in natural history museum might make them enthusiastic to pursue jobs for curators and other museum related jobs.
9	Aquarium Fish Keeping (Theory)	4	ZOOG-SEC-B-4-2-TH	2	100	Knowledge related to fish culture and maintenance. Students will also learn about fish nutrition and transport.	This course will enable students to create entrepreneurship in aquaculture. Interested students can take initiative to open their own start up of fish farming and other productions related to aqua culture. Also it will enable them to answer many question in competitive exams related to animal husbandry.
10	Applied Zoology (Theory)	5	ZOOG-DSE-A-5-1-TH	4	70	This course enables students to gather knowledge on Parasites and parasitic diseases, along with basic idea of epidemiology and host-parasite relationship. They will learn about medically important insects and also poultry farming and fish technology.	The course is of mixed subjects and thus will help student in several edifices of life. The knowledge on infectious disease and their spreading not only help students to seek jobs in health services but also will help them in their daily day lives. Also it will enable them to answer many question in competitive exams related to animal husbandry. The content of course is also important to qualify the NET, SET, GATE and other job oriented examinations and interviews for bio-science students.
11	Applied Zoology (Practical)	5	ZOOG-DSE-A-5-1-P	2	30	This course will help building knowledge about disease-causing parasites, insect vectors and how to identify them. Insect parasites of plants also have been included. Students will visit animal breeding centre to gain information about how to handle and maintain an animal farm.	This course has importance in real life applications like identifying disease causing pathogens and their vectors, which might help to find jobs related to medical pathology labs. Understanding how an animal farm needs to be maintained in reality can also inspire them to set up an entrepreneurship by their own.
12	Aquatic Biology (Theory)	5	ZOOG-DSE-A-5-2-TH	4	70	This course will help students to gain idea about water bodies and their environmental factors. They will learn about lake ecology, stream formation and marine biology. Also knowledge regarding water pollution will be taught in this course.	This course will help students to have knowledge on environment of water bodies and thus how to maintain them during aqua culture. Also it will enable them to answer many question in competitive exams related to animal husbandry.

13	<b>Aquatic Biology (Practical)</b>	5	ZOOG- DSE-A- 5-2-P	4	30	Students will learn how to survey the area of a water body, along with identification of important aquatic planktons. Different chemical parameters will be studied by hands on experiments. They will also visit to a water body for having practical experience of aquatic ecosystems.	This course has importance in real life applications like: how to manage and maintain water bodies for aqua culture. Understanding how an aquatic animal farm needs to be maintained in reality can also inspire them to set up an entrepreneurship by their own.
14	<b>Sericulture (Theory)</b>	5	ZOOG- SEC-A- 5-3-TH	2	100	Students will learn through this course how to build a set up for silk culture. The knowledge regarding biology of silkworm, disease of silk worm, rearing of silk worm and harvesting of silk will be delivered.	This course will enable students to create entrepreneurship in sericulture. Interested students can take initiative to open their own start up of silk worm farming and other productions related to sericulture. Also it will enable them to answer many question in competitive exams related to animal husbandry and seek job to sericulture related industries.
15	<b>Biology of Insects (Theory)</b>	6	ZOOG- DSE-B- 6-1-TH	4	70	This course will continue with General introduction of insects and their role in disease spread. Students will study how different groups of insects are associated with different types of diseases and how to control them.	The course is of mixed subjects and thus will help student in several edifices of life. The knowledge on infectious disease and their spreading not only help students to seek jobs in health services but also will help them in their daily day lives. Also it will enable them to answer many question in competitive exams related to animal husbandry. The content of course is also important to qualify the NET, SET, GATE and other job oriented examinations and interviews for bio-science students.
16	<b>Biology of Insects (Practical)</b>	6	ZOOG- DSE-B- 6-1-P	2	30	This course will help building knowledge about disease-causing insect vectors and how to identify them. Insect parasites of plants also have not been included. Students will do projects on any of chosen insect vectors and their role on zoonotic disease transmission.	This course has importance in real life applications like identifying disease causing vectors, which might help to find jobs related to health services. Also this will enrich their idea about personal and community hygiene.
17	<b>Ecology and Wild life Biology (Theory)</b>	6	ZOOG- DSE-B- 6-2-TH	4	50	This course will enrich them to understand how biological system interacts with inanimate world and surrounding abiotic factors. They will study different aspects of conservation biology, too.	This course will help students to culminate the knowledge of biology, till now they have earned and learned. The content of course is also important to qualify the NET, SET, GATE and other job oriented examinations and interviews for bio-science students.

18	<b>Ecology and Wild life Biology Practical)</b>	6	ZOOG-DSE-B-6-2-P	2	30	Study and identification of animals in field. Introduction to wild life data collection. Students will learn how to study animals in field with an emphasis on mammals and birds.	This is an enormous criterion for a biologist to identify animals properly at field and to understand how do they really behave in wild condition. Basic idea on practical knowledge of field animals will help students to have an idea about basic nature of animals. Zoological Surveys animal behavior laboratories and wild life conservation societies of several countries need efficient field zoologists to identify and study animals in field.
19	<b>Medical Diagnosis (Theory)</b>	6	ZOOG-SEC-B-6-4-TH	2	100	Different diagnostic methods and tests will be studied. Symptoms of non-infectious and infectious diseases will be studied. Clinical tests related to biochemical features, microbiology along with a visit to pathological laboratories to do a project based on experiences, gained there.	This course has importance in real life applications which might help to find jobs related to medical pathology labs. The content of course is also important to qualify the NET, SET, GATE and other job oriented examinations and interviews for bio-science students.

## **Programme Outcomes of B. Sc Zoology**

**1. Understanding the Nature and our position:** Zoology taught us that we, human, are neither the only inhabitants of this earth nor we can live like so. Building compassion towards animal kingdom not only cultivates humanity inside students but also will teach them how to think about others and how to co-operate with all.

**Critical Thinking:** Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

**2.Effective Communication:** Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

**3. Social Interaction:** Elicit views of others, mediate disagreements and help reach conclusions in group settings. While learning about infectious disease and public hygiene, students will learn about different conditions how and where people lives, how different professions can have association with different types of health hazards and also how to prevent them. Thus, they can be prepared for arranging themselves better personal hygiene and community health.

**4. Effective Citizenship:** Demonstrate empathetic social concern and equity-centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

**6.Ethics:** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them. Recognizing that even animals have their own right and if they are not able to defend that we, human, need to come forward will surely enrich their value sense.

**7. Environment and Sustainability:** Understand the issues of environmental contexts and sustainable development. Understanding how and why we need to save and protect the environment and its' several parts including the bio-diversity.

**8. Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

## **Programme Specific Outcomes (PSO) B. Sc Zoology**

1. Students will acquire a comprehensive knowledge and sound understanding of fundamentals of Zoology.

2. Students will develop practical, analytical and statistical skills in Zoology.

3. Students will be prepared to acquire a range of general skills, to solve problems, to evaluate information, to use tools and techniques productively, to communicate with society effectively and learn independently.

4. Students will acquire a job efficiently in diverse fields such as Science and Engineering, Education, Public Services, Animal husbandry, Health services and Business etc.