

DEPARTMENT OF ZOOLOGY

PROGRAMME OUTCOME



DEPARTMENT OF ZOOLOGY PROGRAMME OUTCOMES	
PO 1	Acquiring in-depth knowledge
PO 2	Analysis and corroboration
PO 3	Laboratory skills and Instrumentation
PO 4	Skill Enhancement
PO 5	Design and Performance of Experiments
PO 6	Analysis with statistical inference
PO 7	Building of Environmental ethics, Sustainability and Conservation
PO 8	Communication, bonding and learning through group activity

Programme Specific outcome in Zoology

PSO1: Students will develop understanding of key concepts of biology at organismic, ecological, behavioural, physiological, biochemical and molecular levels.

PSO2: Students are built a true and clear concept of genetic and molecular principles of traits from human and non-human organisms. Description of several molecular event for controlling gene expression in several physiological processes including sex determination.

PSO3: Students get the knowledge of internal structure of cell, its functions in controlling of various metabolic pathways of s organisms.

PSO4: Students become aware of animal-animal, animal-plant, animal-microbe interactions and their consequences to environment with special emphasis on conservation. It helps to understand environmental conservation process and its importance, pollution control and biodiversity and protection of endangered species.

PSO5: Students will gather knowledge of internal structure of cell, its functions and control of various metabolic functions of organisms.

PSO6: Students get understanding on medical entomology, apiculture, aquaculture, sericulture and medical diagnostics, animal cell biotechnology and modern biotechnological tools.

PSO7: Students will develop theoretical and practical knowledge in handling the animals and their role in environment.

PSO8: As a whole through this programme students gain high standards of learning in animal sciences and develop multidisciplinary approach to work with a collaborative manner to gather a wholesome knowledge of biological processes.

Course Outcome (Department of Zoology)
Programme-Honours, For the Session-2018-2019, 2019-2020, 2020-2021

Year	Semester	Paper	Course	Outcome
	Semester-I	CC-1-1-TH	CO 1	<p>CO1.1: Students understand the non-chordate world that surrounds us through this module.</p> <p>CO1.2: Students learn the process of evolution in non-chordates from unicellular cells to complex, multicellular organisms.</p> <p>CO1.3: Students get the ideas to identify the invertebrates and classify the map to the class level with the basis of system aticin this module.</p> <p>CO1.4: Students learn the basis of life processes in the non-chordates and recognize the economically important invertebrate fauna.</p> <p>CO1.5: Students get general characters and classification of Acoelomates to Pseudocoelomates and the affinities between different groups.</p>
		CC-1-1-P		<p>CO1.6: Through this, students get the idea of general characters and classification of Acoelomates to Pseudocoelomates.</p> <p>CO1.7: Students learn to identify animals through this practical learning involving animal material using models/charts/e-resources and this will help students to identify organisms.</p>
		CC-1-2-TH	CO2	<p>CO2.1: Students get idea of life at the molecular level.</p> <p>CO2.2: Students get the concepts of developments in molecular biology and its implications in human welfare.</p> <p>CO2.3: Learners are exposed to the emerging field of research in Molecular Biology.</p>

Part-I		CC-1-2-P		CO2.4: Students gain observational, analytical and evaluation skills in molecular biology.
	Semester-II	CC-2-3-TH	CO3	CO3.1: The learners get the idea on general characters and classification of coelomates and the affinities between different groups. CO3.2: Students understand the classification of whole phyla includes in Nonchordates with the help of charts/models/pictures. CO3.3: Students will gain knowledge about various internal systems like Digestive system, nervous system with the help of charts. Understand the evolutionary history of coelomate Nonchordates.
		CC-2-3-P		CO3.4: Students become acquainted with the general characters and classification of coelomates. CO3.5: Students will gain knowledge on survey of the phyla through charts, models and e-resources.
		CC-2-4-TH	CO4	CO4.1: Students develop deeper understanding of what life is and how it functions at cellular level. CO4.2: The students learn about cellular membrane structure and function, fine structure and function of cell organelles. CO4.3: Students are taught to perform a variety of molecular and cellular biology techniques.
		CC-2-4-P		CO4.4: Students get ability to handle and adjust microscopes through this practical. CO4.5: Students develops skills to observe chromosomal arrangements during cell division. CO4.6: Students learn to distinguish different chromosomal alterations in man.

Part-II	Semester-III	CC-3-5-TH	CO5	CO5.1: Students will be inculcated fascination for nature and learn the bionomics of vertebrates.
		CC-3-5-P		CO5.2: Students learn the evolution, hierarchy and classification of different classes of chordates. CO5.3: Students get an overview of the morphology and physiology of typical examples. CO5.4: Students become familiar about the adaptations and economic importance of specific vertebrates.
		CC-3-6-TH	CO6	CO5.5: Students are acquainted with the systematic positions of animals, morphological features and relations among different animals through charts, models and e-resource through this practical.
		CC-3-6-P		CO6.1: Students get knowledge about the function of various systems. CO6.2: Students get an overview of the morphology and physiology of typical examples. CO6.3: Students become familiarized with the physiology of human body and learn to take precautionary measures to safe guard their health. CO6.4: Students get the knowledge on the structure and function of each system in the human body.
		CC3-7-TH	CO7	CO6.5: Students will develop skill in simple biophysiological laboratory procedures.
		CC3-7-TH		CO7.1: This unit helps students to understand structural arrangements of carbohydrates and the application of their structures in metabolism of carbohydrate and regulation of metabolism of carbohydrate which is key source of energy of living organisms. CO7.2: Lipids serve as metabolic fuels alternative to glucose. Lipids are a

			<p>component of cell membranes. Students get idea of structural arrangements of lipids and the application of their structures in metabolism of lipids and regulation of metabolism of lipids.</p> <p>C07.3: Students learn the structure of amino acids those are the monomers of protein and structure of amino acids provide chemical nature of protein, along with the structural arrangements of proteins and the application of their structures in metabolism of protein and regulation of metabolism of protein.</p> <p>C07.4: Students learn structure of nucleic acids and their metabolisms, and their biosynthesis.</p> <p>C07.5: Students get an idea of nomenclature, classification, specificity of enzyme, mechanism of enzyme action, enzyme kinetics, factors affecting rate of enzyme-catalyzed reactions, enzyme inhibition</p> <p>C07.6: Students understand mitochondrial respiratory chain, inhibitors and un-couplers of electron transport chain, mechanism of electron transport chain and oxidative phosphorylation which are main mechanisms for energy production in cell.</p>
		CC-3-7-P	<p>C07.7: Students understand the technical aspect of qualitative analytical techniques to detects biomolecules like carbohydrate, protein and lipid. These techniques help students to understand to detect different carbohydrate, protein and lipid molecules.</p> <p>C07.8: Students get knowledge on qualitative analysis techniques to detect biomolecules like Urea and Uric acid, these techniques help them to understand diagnostic techniques of Urea and Uric acid.</p>

				<p>CO7.9: Students will learn that biomolecules are separated by their charge, molecular weight, size and chemical nature. Along with this the nature of the matrix of the substratum which is used to separate the molecules also influences these separation techniques.</p> <p>CO7.10: Through this quantitative analysis technique students understand that concentration of soluble biomolecules can be detected by optical density of the solution where the biomolecule is solute.</p>
		SEC(A)-3-1-TH	CO8	<p>CO8.1: Students learn the morphology of bees and their social behaviour.</p> <p>CO8.2: Students understand the culture methods of honeybees and get introduced with different modern instruments in this module.</p> <p>CO8.3: Students gain an idea about disease of honeybees and control measures.</p> <p>CO8.4: Students gain idea about the apiculture products and their uses.</p> <p>CO8.5: Students learn about the modern methods to improve bee industry</p>
		SEC(A)-3-2-TH	CO9	<p>CO9.1: Student will learn about taxonomy, morphology and distribution of silk moth.</p> <p>CO9.2: Students will learn the life history of <i>Bombyx mori</i>.</p> <p>CO9.3: Students will learn the culture of mulberry plant</p> <p>CO9.4: Students gain knowledge about pest and disease of silk moth</p>
		CC-4-8-TH	CO10	<p>CO10.1: The integument is one of the most dynamic and important of organs. Having a unique role as a first line defence against numerous environmental laws, this chapter provides students with comparative</p>

	<p style="text-align: center;">Semester-IV</p>		<p>anatomy of integument. Students will understand the structure, function and derivatives of integument in amphibian, birds and mammals.</p> <p>CO10.2: Digestive System-Through this unit students get idea incomparative anatomy of stomach; dentition in mammals, both have importance indigestive mechanism.</p> <p>CO10.3: Students will understand comparative anatomy of respiratory organs in fish, birds and mammals and their evolutionary significance from this unit.</p> <p>CO10.4: Students understand about general plan of circulation, comparative account of heart and aortic arches which helps to understand evolutionary approaches of circulation system.</p> <p>CO10.5: Students learn to understand evolution of urino-genital ducts and succession of kidney in different vertebrate groups as it is important to understand excretion system.</p> <p>CO10.6: Students learn comparative account of brain in vertebrates; cranial nerves; olfactory and auditory receptors invertebrates, it helps to understand the evolution of nervous system and sense organs invertebrate.</p> <p>CO10.7: Students understand axial and appendicular skeleton – limbs, girdles of pigeon; jaw suspension in mammals which helps to understand the comparative anatomy of skeletal system invertebrates.</p>
		<p>CC-4-8-P</p>	<p>CO10.8: Students learn comparative study of placoid, cycloid and ctenoid scales through permanent slides/photographs through this practical.</p> <p>CO10.9: This unit provides study of disarticulated skeleton of toad, Pigeon, Guineapig (limb bones, vertebrae, limb</p>

			<p>and girdle).</p> <p>CO10.10: The students will learn about comparative study of heart and brain of different vertebrate species of different class with the help of model/picture to understand the evolution of heart and brain.</p> <p>CO10.11: Students will understand the differences between the skulls of Pigeon, one herbivore (Guineapig) and one carnivore (Dog) animal through identification. It will help to understand the evolution of jawless skull, and the skull with jaw, and it will also help to understand the jaw and dentition pattern of carnivore and herbivore.</p>
		CC-4-9-TH	<p>CO11</p> <p>CO11.1: Students get understanding of physiology of digestion, structural organization and function of gastro-intestinal tract; mechanical and chemical digestion of food, absorption of Carbohydrates, Lipids and Proteins in Human-from this, students understand digestion and working procedure of gastro-intestinal tract.</p> <p>CO11.2: Students learn physiology of respiration- mechanism of respiration, respiratory volumes and capacities, transport of Oxygen and Carbon dioxide in blood, Dissociation curves and the factors influencing it, respiratory pigments; Carbon monoxide poisoning from this, students understand the mechanism of respiration and the working process of respiratory pigments.</p> <p>CO11.3: Students learn the physiology of Circulation-Ultra-structure of haemoglobin and its association and dissociation with oxygen and carbon dioxide helps students to understand mechanism of oxygen and carbon dioxide transport, ABO blood grouping system provides the concepts of multiple allelic traits and agglutination</p>

			<p>system.</p> <p>CO11.4: Students learn the physiology of Heart, through this, students understand cardiac cycle, cardiac output, coronary circulation, cardiac impulse</p> <p>CO11.5: Students become aware of thermal regulation in camel and polar bear and osmoregulation in aquatic vertebrates. This provides the idea of thermoregulation mechanisms indifferent animals and water salt balancing procedure in animal in students.</p> <p>CO11.6: Students get the idea of urine formation, types of urine and structure of kidney</p>
		CC-4-9-P	<p>CO11.7: Students learn to understand ABO blood grouping system and multiple allelic trait and the effect of co-dominance.</p> <p>CO11.8: Students learn to estimate haemoglobin in given blood sample.</p> <p>CO11.9: Students learn characteristic features of human blood cells.</p> <p>CO11.10: Students learn to prepare the haemin crystals and haemochromogen crystals</p> <p>CO11.11: Through this practical module students learn the characteristic features of blood cells of cockroach. It provides the idea of blood cells</p> <p>CO11.12: Students learn to detect blood pressure of an individual which helps students to measure blood pressure.</p>
		CC-4-10-TH	<p>CO12</p> <p>CO12.1: Students get the concepts of cells and organs of the Immune system to students</p> <p>CO12.2: Students understand about Anatomical barriers, Inflammation, Cell and molecules involved in innate</p>

			<p>immunity, Adaptive immunity (Cell mediated and humoral).</p> <p>CO12.3: Students get an idea of Antigenicity and immunogenicity, Immunogens, Adjuvants and haptens, Factors influencing immunogenicity, B and T-Cell epitopes</p> <p>CO12.4: Students learn about the structure and functions of different classes of immunoglobulins, Antigen-antibody interactions, Immunoassays (ELISA and RIA), Monoclonal antibody production.</p> <p>CO12.5: Students gain knowledge about structure and functions of MHC molecules and structure of T cell Receptor and its signalling, T cell development and selection.</p> <p>CO12.6: Students come to know about types, properties and functions of cytokines.</p> <p>Unit12.7: This unit explains students about the components and pathways of complement activation.</p> <p>CO12.8: Students get a basic idea of Gell and Coombs' classification and brief description of various types of hypersensitivities.</p> <p>CO12.9: Students come to know about the various types of vaccines. Active and passive immunization (Artificial and natural).</p>
		CC-4-10-P	<p>CO12.10: Students get an idea of lymphoid organ through demonstration of demonstration of lymphoid organs (by picture).</p> <p>CO12.11: Students are taught about histology of Bursa fabricius, spleen, thymus and lymph nodes through slides/Photographs. Students will gain knowledge of these tissue sections from this module.</p> <p>CO11.13: Students learn the technique ELISA, which explains antigen</p>

				antibody reaction.
		SEC(B)-4-1-TH	CO13	<p>CO13.1: Students are introduced with Aquarium fishery, its potential, candidate fishes.</p> <p>CO13.2: Students get a basic idea of the biology of some indigenous as well as exogenous ornamental fishes.</p> <p>CO13.3: Students get knowledge of use of live feed in aquarium culture, feed formulation and larval control by ornamental fishes in students.</p> <p>CO13.4: Students gain knowledge about fish handling techniques, transport and packaging.</p> <p>CO13.5: Students get practical knowledge regarding the set-up of an aquarium and its budget.</p>
		SEC(B)-4-2-TH	CO14	<p>CO14.1: Students are introduced with pathological instruments and helps to understand the various diagnostic method to analysis blood sample</p> <p>CO14.2: Students come to know the physiology of urine and also learn the clinical procedure to analysis urine.</p> <p>CO14.3: Students will be able to explain the clinical feature and prevention technique of non-infectious diseases</p> <p>CO14.4: Students will understand the infectious diseases.</p> <p>CO14.5: Students get aware about the clinical and biochemical procedures.</p> <p>CO14.6: Students understand the basic nature of antibiotics and its applications in medical science.</p> <p>CO14.7: Students gain the knowledge about Tumours, its diagnostic methodology and medical treatment.</p> <p>CO14.8: This unit helps the students to learn about the clinical procedures and laboratory methods.</p>

Semester-V	CC-5-11-TH	CO15	<p>CO15.1: It gives an understanding of general and fundamental idea about ecology, environment, biosphere and its level of organisation and limiting factors.</p> <p>CO15.2: It provides the students with the idea about population ecology, unitary and modular populations, different attributes of population, its growth models and several interactive forces such as competition for regulation of population.</p> <p>CO15.3: It provides the students the basic and in-depth characteristics of community, several diversity in dices and stratification and succession in community.</p> <p>CO15.4: It gives Students an in-depth idea about ecosystem functioning with different food chain models, food web structure, ecological pyramids and geo-chemical cycles.</p> <p>CO15.5: Students become aware of biodiversity, diversity hotspots, flagship species, conservation strategies, Red data book with special emphasis on conservation of Tiger, Olive ridley and white rumped vulture.</p>
	CC-5-11-P		<p>CO15.6: Students get an opportunity to determine population density and several diversity indices.</p> <p>CO15.7: Students get an opportunity of hands-on study of aquatic ecosystem through measurement of several ecological parameters.</p> <p>CO15.8: Excursion provides students a true and hands-on training of ecological theories and proper interaction with nature and submission of are port for the same.</p>
	CC-5-12-TH	CO16	<p>CO16.1: Students learn about basic idea of Mendelian Genetics and different types alleles and their interaction.</p>

Part-III			<p>CO16.2: Students get the concepts of Linkage and crossing over, construction of gene map through recombination frequency.</p> <p>CO16.3: Students get an idea about Mutations, its reasons, mechanism, types with examples from <i>Drosophila</i>.</p> <p>CO16.4: Students get in-depth idea of sex determination process in <i>Drosophila</i> and human.</p> <p>CO16.5: Students get an idea of extra-chromosomal inheritance.</p> <p>CO16.6: Students get concept on rII locus and idea about complementation in students.</p> <p>CO16.7: Students get an idea about transposable genetic elements in <i>Drosophila</i>, interspersed sequences and Alu in Human.</p>	
		CC-5-12-P	<p>CO16.8: Students learn the principles of chi-square test.</p> <p>CO16.9: Students will learn to identify chromosomal aberration through photographs and models.</p> <p>CO16.10: Students will be taught the Analytical techniques of inherited traits through Pedigree analysis.</p>	
		DSE(A)-5-1-TH	CO17	<p>CO17.1: Students get an over view of the different parasites, its structure and function, their life cycles, mode of transmission, pathogenicity and control measures.</p> <p>CO17.2: Students learn about parasites to lead a healthy life.</p>
		DSE(A)-5-1-P		<p>CO17.3: Students gain knowledge about different parasites, its structure and function, their life cycles, mode of transmission, pathogenicity through slides and microphotographs helps to understand the mode of transmission of parasite.</p>

		DSE(A)-5-2-TH	CO18	<p>CO18.1: It helps to know the taxonomy of insects.</p> <p>CO18.2: Students understand the general morphological structure of insect.</p> <p>CO18.3: Students gain knowledge about the different metabolic function of insect.</p> <p>CO18.4: Students get an idea about social behavior of insect.</p> <p>CO18.5: It helps the students to understand the co-reaction and interaction with plant and insect and basic idea about insect pest.</p> <p>CO18.6: It helps the students to know the pathogenic role of insect to spread diseases</p>
		DSE(A)-5-2-P		<p>CO18.7: It provides the students with the detail knowledge about insect life cycle and reproduction procedures</p> <p>CO18.8: It familiarize students with different methodology of culturing insects</p> <p>CO18.9: Provides knowledge about insect pest.</p>
		DSE(B)-5-1-TH	CO19	<p>CO19.1: It provides the students with the knowledge about the basic idea of endocrinology.</p> <p>CO19.2: It helps students to learn about the CNS and its hormonal function and feedback mechanism.</p> <p>CO19.3: It helps the students to understand the morphology of endocrine gland and their hormonal control.</p> <p>CO19.4: It provides students abasic idea about various types of hormone receptor and their application in modern endocrinology.</p> <p>CO19.5: Students gain the concept of role of hormone in non-mammalian</p>

			vertebrate
	DSE(B)-5-1-P		<p>CO19.6: Students develop skill in microtomy.</p> <p>CO19.7: It helps the Students to learn the dissection skill and lead the to learn the anatomy of animals.</p> <p>CO19.8: It helps the students to learn the preparation of histological slide.</p>
	DSE(B)-5-2-TH	CO20	<p>CO20.1: Students understand the process of animal development and to know the role of different hormones in reproduction process through this module.</p> <p>CO20.2: It helps students to understand the structure and morphology of male reproductive organ and also know how the accessory organs involved in this process.</p> <p>CO20.3: It helps the students to understand the structure and morphology of female reproductive organ and also know how the accessory organs involved in this process.</p> <p>CO20.4: Students learn the concept about infertility and how it increased by some environmental factors and also gain knowledge about modern diagnosis technique of infertility like IVF and IUI</p>
	DSE(B)-5-2-P		<p>CO20.5: It teaches the students to maintenance of animal house</p> <p>CO20.6: It helps the students to understand the microtomy technique</p> <p>CO20.7: Students learn to prepare histological slide and tissue.</p>
Semester-VI	CC-6-13-TH	CO21	<p>CO21.1: It gives students a fundamental idea about gametogenesis, fertilization, cleavage and blastulation in non-chordate and chordate organism. Gives an idea about Fate mapping and its techniques and</p>

				<p>organizer concept.</p> <p>CO21.2: Students get idea about late embryonic development such as formation of extra-embryonic membrane, implantation process and placental development through this module.</p> <p>CO21.3: Students get an idea of eye and brain development process and role of induction.</p> <p>CO21.4: Students become aware regarding modern application of developmental biology such as IVF, stem-cell therapy, bone marrow transplantation and cartilage regeneration.</p>
		CC-6-13-P		<p>CO21.5: This module imparts knowledge regarding developmental process through the study of different stages of embryonic development, life-cycle stages, stages of placental development in students.</p> <p>CO21.6: This module gives students acknowledge about larval development and their inter and intra relationship.</p>
		CC-6-14-TH	CO22	<p>CO22.1: It gives the students abasic idea of origin of life and RNA world, historical review of evolutionary concepts and base line of Lamarkism and Darwinian theory.</p> <p>CO22.2: Students will earn the concept of Geological time scale and fossil can generate the idea of evolutionary process, natural selection and modes of evolution.</p> <p>CO22.3: Students get an idea of speciation and forces and the mechanism responsible for speciation.</p> <p>CO22.4: It generates idea of population genetics through the calculation of gene and genotypic frequency and Hardy-Weinberg equilibrium and forces altering the equilibrium among students.</p>

				CO22.5: It generates the idea of role of extinction in evolution and analysis of phylogenetic tree and concept of divergent and convergent evolution in students.
		CC-6-14-P		CO22.6: Students gain idea of evolution through the study of fossils, homologous and analogous organs. CO22.7: This module generates an in-depth idea regarding evolutionary relationship among individuals through the construction and interpretation of phylogenetic tree based on phonetic and cladistic principles.
		DSE(A)-6-1-TH	CO23	CO23.1: It provides concept and scope of Biotechnology with in students. CO23.2: Students will learn the techniques in Gene manipulation – this unit helps to make concept on vectors of RDT, forming Genomic and c- DNA library and transforming techniques in RDT CO23.3: Students start to conceptualise animal cell culture technique. Animal cell culture is very important part in molecular biology laboratories and pharmaceutical industries. Students will get theoretical approach of it. CO23.4: Fermentation procedures and techniques of fermentation procedures are important in food industries, pharmaceutical industries, and beverage industries, this unit provides the students with fundamentals of fermentation procedures and techniques in them to students. CO23.5: This unit gives students the concepts of hybridoma technology, production of recombinant proteins like Insulin and growth hormones. These concepts are very useful in pharmaceutical industries and biotech industries.

		DSE(A)-6-1-P		<p>CO23.6: Packing and sterilization of glass and plastic wares for cell culture-trains students to sterilize the glass wares before using them in experiment. It is very important part in experiments.</p> <p>CO23.7: Students learn preparing culture media for bacterial growth, animal tissue culture and plant tissue culture are important in Biotechnology laboratory.</p> <p>CO23.8: From this students will learn to construct genomic library.</p> <p>CO23.9: Students start to conceptualise to construct vectors and to separate the fragments of DNA</p> <p>CO23.10: It is useful unit where students will learn to separate DNA, RNA, proteins and amplification of fragment of DNA.</p>
		DSE(A)-6-2-TH	CO24	<p>CO24.1: Students understand genome concepts and organization of genome.</p> <p>CO24.2: Students get basic concepts of RDT techniques, restriction techniques, construction of genomic and c-DNA library, vectors for transporting the gene of interest in host cells, transformation techniques of GMO, amplification of DNA by PCR, and genomic polymorphism studies through FLP and RAPD, these techniques are very useful in biotech, pharmaceutical, agricultural and food industries.</p> <p>CO24.3: Students understand about genetically modified organisms, procedure of formation of GMO, application of GMO, and ethics of GMO. GMO are very useful in biotech industries for recombinant protein research.</p> <p>CO24.4: This is important unit where students get an idea of animal cell culture, procedure of animal cell culture, and application of cultured</p>

				animal cell for molecular diagnosis of mutation related disorders and for the study of recombinant proteins or for the production of vaccines.
		DSE(A)-6-2-P		<p>CO24.5: This is important part and initial step of RDT, and applicable in all Biotech, pharmaceutical research laboratories. Students will learn those techniques from this unit.</p> <p>CO24.6:Through this unit students will learn to conceptualise – Southern Blotting, Northern Blotting, Western</p> <p>Students will learn the techniques of DNA fragments separations, RNA separations, protein separations , DNA amplification, these are very useful techniques in Biotech, pharmaceutical and food industries.</p> <p>CO24.7-Through this students learn research approach of biotech research.</p>
		DSE(B)-6-1-TH	CO25	<p>CO25.1: Students get idea about the science of ethology, different types of behavioural pattern, learning and cognition to</p> <p>CO25.2: Students get concepts on the idea of social and sexual behaviour</p> <p>CO25.3: Students learn the idea of different biological rhythms and biological clock.</p>
		DSE(B)-6-1-P		<p>CO25.4: Students gain an idea of individual and social behavior with the study of different behavioural pattern in different animals.</p> <p>CO25.5: Through field study students get a hands-on training of behavioural study and submission of report generates the capacity of documentation, data collection, observation, analysis and representation.</p>
		DSE(B)-6-2-TH	CO26	CO26.1: It gives students basic idea regarding classification, feeding,

			<p>habitat and reproduction of fishes.</p> <p>CO26.2: Morphology and physiology of fishes can generate a proper idea of fish biology and its implications in different area of fishery science.</p> <p>CO26.3: Students gain knowledge regarding different types fisheries sectors, causes of fishery resource depletion and the provisions to overcome this.</p> <p>CO26.4: Types aquaculture and different techniques used can generate a whole some knowledge of fishery science and can help the students to prepare for applying this knowledge to initiate one's own start-up.</p> <p>CO26.5: Students gather knowledge regarding the exploration of different fishes as a model in scientific research.</p>
		DSE(B)-6-2-P	<p>CO26.6: Students learn the identification technique through the study morphometry and meristic characters, scales and whole fish specimen study</p> <p>CO26.7: Students learns of crafts and gears and water quality parameters can generate practical knowledge of the aquacultural practices.</p> <p>CO26.8: Visit to fishery farm ensures students a whole knowledge build-up of how a fishery farm or fishery unit works and its management procedure.</p>

Programme-General, For the Session-2018-2019, 2019-2020, 2020-2021

Year	Semester	Paper	Course	Outcome
Part-I	Sem-I	CC1/GE1	C01	<p>C01.1: Students will learn the general characteristics and classifications of phylum Nonchordate and Chordate help student to know animal kingdom properly</p> <p>C01.2: Students will be familiar with the non-chordate world that surrounds us</p> <p>C01.2: Students learn to identify the invertebrates and classify them up to the class level with the basis of systematics.</p> <p>C01.3: Students understand the basis of life processes in the non-chordates and recognize the important invertebrate fauna.</p> <p>C01.4: Students knowledge about the various internal systems within students.</p> <p>C01.5: Students learn about the evolution, hierarchy and classification of different classes of chordates.</p> <p>C01.6: Students get an overview of the morphology and physiology of typical examples</p> <p>C01.7: Students are acquainted with the systematic positions of animals, morphological features and relations among different animals through charts, models and e-resource.</p>
	Sem-II	CC2/GE2	C02	<p>C02.1: Students come know integument with respect to glands</p> <p>C02.2: Students come to know different types of internal organs, like-digestive system, circulatory system, respiratory system, urino-genital system.</p> <p>C02.3: Students come the processes of early embryonic development like- gametogenesis, fertilization, fate map, gastrulation.</p> <p>C02.4: Students learn the processes of late embryonic development like placenta, metamorphosis in frog.</p> <p>C02.5: Students develop the comparative idea of osteology of Pigeon, Guineapig and Dog in</p>

				<p>students.</p> <p>CO2.6: Students develop the comparative idea of different types of placenta in students.</p> <p>CO2.7: Students develop the comparative idea of developmental stages of chick embryo and morphological features of larva in students.</p>
Part-II	Sem-III	CC3/GE3	CO3	<p>CO3.1: Students learn about structure and function of nerve and muscle</p> <p>CO3.2: Students understand physiology of digestion</p> <p>CO3.3: Students understand physiology of respiration and transport at ion of oxygen and carbon-di- oxide</p> <p>CO3.4: Students understand composition of blood, structure of heart to this through this module.</p> <p>CO3.5: Students learn about excretion system</p> <p>CO3.6: Students understand reproduction and effect of endocrine in reproduction</p> <p>CO3.7: Students understand metabolism of carbohydrate, lipid, protein</p> <p>CO3.8: Students understand the action of enzyme to students.</p> <p>CO3.9: Students develop the idea of histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland, duodenum, liver, lung, kidney and qualitative test of carbohydrate.</p>
		SEC-A(1)	CO4	<p>CO4.1 Students learn about the morphology of bees and their social behaviour.</p> <p>CO4.2: Students understand the culture methods of honey bees and introduce with different modern instruments.</p> <p>CO4.3: Students gain idea about disease of honey bees and control measures.</p> <p>CO4.4: Students understand about the apiary products and their uses.</p> <p>CO4.5: Students come to know about the modern methods introduced to improve bee industry</p>

	Sem-IV	CC4/GE4	CO5	<p>CO5.1: This unit gives the concept of procedure of genetic inheritance with special reference of White eye locus and Thalassemia.</p> <p>CO5.2: Students get idea on crossing over techniques and linkage of gene.</p> <p>CO5.3: Students learn about types of gene mutation and procedure of gene mutation students.</p> <p>CO5.4: Students learn about sex determination process in <i>Drosophila</i> to students.</p> <p>CO5.6: Students get idea about origin of life (chemical).</p> <p>CO5.7: Students will be taught the evolutionary theories like Lamarckism, Darwinism, Neo-Darwinism.</p> <p>CO5.8: Students learn about isolation mechanism and natural selection</p> <p>CO5.9: Students learn about speciation procedure like Sympatric, Allopatric and Parapatric.</p> <p>CO5.10: Students are taught verification of Mendelian ration through Chi-square test.</p> <p>CO5.11: Through karyotypes students learn to identify aneuploidy.</p> <p>CO5.12: Students learn phylogeny of horse by diagram of skull and limb.</p> <p>CO5.13: Students learn the adaptive radiation through studying the photographs of Darwin's finches.</p> <p>CO5.14: Visiting to natural history museum and submission of report teaches tracking the fosile record, and evolutionary mechanism of life.</p>
		SEC-B(1)	CO6	<p>CO6.1: The students are introduced in Aquarium fishery, its potential, candidate fishes.</p> <p>CO6.2: The students get abasic idea of the biology of some indigenus as well as exogenous ornamental fishes.</p> <p>CO6.3 Students get knowledge of use of live feed in aquarium culture, feed formulation and larval control by ornamental fishes.</p>

				<p>C06.4: Students gain knowledge about fish handling techniques, transport and packaging.</p> <p>C06.5: Students gain practical knowledge regarding the set-up of an aquarium and its budget.</p>
Part-III	Sem-V	DSEA(1)	C07	<p>C07.1: Students get idea of types of parasites, types of host and their interactions.</p> <p>C07.2: Students learn epidemiology of diseases, transmission processes and their prevention.</p> <p>C07.3: Students are taught life History and pathogenicity of <i>Entamoeba histolytica</i>, <i>Plasmodium vivax</i> and <i>Trypanosoma gambiense</i>.</p> <p>C07.4: Students are taught about life cycles of parasitic helminths.</p> <p>C07.5: Students learn about biology, control and damage created by economically important insects.</p> <p>C07.6: students about medical importance and control of <i>Anopheles</i> sp.</p> <p>C07.7: Students will gain concepts of animal husbandry.</p> <p>C07.8: It provides students with the knowledge of principles of poultry breeding, management of breeding stock and broilers, Processing and preservation of eggs.</p> <p>C07.9: It teaches students the procedures of genetic improvements in aquaculture industry, induced breeding and transportation of fish seed</p> <p>C07.10:- Students learn about parasite through study of <i>Plasmodium vivax</i>, <i>Entamoeba histolytica</i>, <i>Trypanosoma gambiense</i>, <i>Ancylostoma duodenale</i> and <i>Wuchereria bancrofti</i> and their life stages through permanent-slides/ photomicrographs or specimens.</p> <p>C07.11: Students get an idea of arthropod vectors associated with human diseases: <i>Pediculus</i>, <i>Culex</i>, <i>Anopheles</i>, <i>Aedes</i></p> <p>C07.12: Students are taught the Study of insect damage to different plant parts/stored grains</p>

			<p>through damaged products/photographs.</p> <p>CO7.13: Students will be taught about Identifying feature and economic importance of <i>Helicoverpa</i>, <i>Heliiothisarmigera</i>, <i>Papiliodemoleus</i>, <i>Pyrillaperpusilla</i>, <i>Callosobruchuschinensis</i>, <i>Sitophilus oryzae</i> and <i>Tribolium castaneum</i>.</p> <p>CO7.14: Visit to poultry farm or animal breeding centre and Submission of visit report provides the basic ideas of pisciculture, parasitology, interaction of host, parasite and vectors and their characteristic features, and medical and economical importance of some insects.</p>	
		DSEB(1)	CO8	<p>CO8.1: From this unit students gather knowledge about aquatic ecosystem.</p> <p>CO8.2: Students learn about the lake ecosystem.</p> <p>CO8.3: Students get familiar with marine life.</p> <p>CO8.4: Students will learn about the aquatic pollution and its effects on aquatic bodies.</p> <p>CO8.5: Students learn to estimate of dissolve O₂ and CO₂</p> <p>CO8.6: Through this unit students acquire knowledge about different aquatic microorganism</p> <p>CO8.7: The module helps students to learn about aquatic ecosystem and measuring technique</p>
		SECA(2)	CO9	<p>CO9.1: This unit provides students with a basic idea about taxonomy, morphology and distribution silk moth.</p> <p>CO9.2: Students gain knowledge the life history of <i>Bombyx mori</i>.</p> <p>CO9.3: Students can understand the culture of mulberry plant through this unit.</p> <p>CO9.4: Through this unit students get knowledge about pest and disease of silk moth</p>
	Sem-VI	DSEA(2)	CO10	<p>CO10.1: Students get the knowledge about insect and their morphology.</p> <p>CO10.2: Students get familiar with vectors and their adaptation.</p> <p>CO10.3: Students understand the taxonomy of</p>

			<p>Insect trough this unit.</p> <p>CO10.4: Students learn about the Dipterans and its negative role in human pathology.</p> <p>CO10.5: Students understand various disease vectors through this unit.</p> <p>CO10.6: Students learn about the Siphunenlata and its harmful effect in human population.</p> <p>CO10.7: Students are introduces with different bugs and their harmful effect and control measure.</p> <p>CO10.8: Students are demonstrated about different insect vectors through photographs</p> <p>CO10.9: Students learn about morphology of insect</p> <p>CO10.10: Students learn to prepare project report</p>
	DSE B (2)	CO11	<p>CO11.1: Students gather knowledge about ecology, environment.</p> <p>CO11.2: Students learn about helps to learn about the population.</p> <p>CO11.3: Students gain skill to acquire data about the community, nature, structure etc.</p> <p>CO11.4: Students get ability to learn about ecosystem, its composition, energy, development, growth etc.</p> <p>CO11.5: Students are introduced to wild life, its conservation, methodology, types etc.</p> <p>CO11.6: Students learn to measure pH of different water sample using pH meter, estimation of O₂ & CO₂</p> <p>CO11.7: Students get familiar with different instruments for ecological study</p> <p>CO11.8: Students get a basic idea of flora and fauna</p>
	SEC B(2)	CO12	<p>CO12.1: Through this unit of practical students are taught about Blood composition, Preparation of blood smear and Differential Leucocyte Count (D.L.C) using Leishman's stain, Platelet count using haemocytometer, Erythrocyte Sedimentation Rate.</p>

				<p>CO12.2: The students get knowledge of Urine Analysis, Physical characteristics; Abnormal constituents, Urine culture to students.</p> <p>CO12.3: Students gain knowledge about the causes, types, symptoms, complications, diagnosis and prevention of Diabetes (Type I and Type II), Hypertension (Primary and secondary), Testing of blood glucose using Glucometer/Kit</p> <p>CO12.4: This unit helps students to learn to find out causes, types, symptoms, diagnosis and prevention of Tuberculosis and Hepatitis, Malarial parasite</p> <p>CO12.5: Students learn to study Lipid profiling, Liver function test. PSA test.</p> <p>CO12.6: Students are taught about Antibiotic Sensitivity Test</p> <p>CO12.7: It provides the students with the idea of types (Benign/Malignant), Detection and metastasis; Medical imaging: X-Ray of Bone fracture.</p> <p>CO12.8: Visit to Pathological Laboratory and Submission of Project helps the students to have a hands-on training on Pathology.</p> <p>CO12.9: Visit to a pathological laboratory helps the students to gain a hands-on knowledge of the techniques and submission of a project report enhances the ability of the students to document and represent data.</p>
--	--	--	--	---

Mapping of PO And CO

P01. ACQUIRING N-DEPTH KNOWLEDGE	P02. ANALYSIS AND CORROBORATION	P03. LABORATORY SKILLS AND INSTRUMENTA TION	P04. SKILL ENHANCEMENT	P05. DESIGN AND PERFORMANE OF EXPERIMENTS	P06. ANALYSIS WITH STATISTICAL INFERENCE	P07. BUILDING OF ENVIRONMENTAL ETHICS, SUSTAINABILITY AND CONSERVATION	P08. COMMUNICATION, BONDING AND LEARNING THROUGH GROUP ACTIVITY
C01	C02	C02	C08	C07	C015	C015	C09
C02	C04	C04	C09	C011	C016	C018	C014
C03	C015	C06	C013	C015	C025	C025	C015
C04	C016	C07	C014	C019			C026
C05		C012		C023			
C06		C023		C024			
C010		C024					
C012							