Gour Mohan Sachin Mandal Mahavidyalaya

Department of Zoology
Evaluative Report

Gour Mohan Sachin Mandal Mahavidyalaya

DEPARTMENT OF ZOOLOGY

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INTRODUCTION

I don't care two hoots about civilization. I want to wander in the wild.

—Jane Goodall

Zoology or Animal Biology is the study of living organisms, specifically animals. It relates to the animal kingdom, including the structure, embryology, evolution, classification, habits, distribution of animals both living and extinct and how they interact with their ecosystem. The history of Zoology can be traced back to the study of the animal kingdom by Aristotle and Galen.

During the 18th and 19th centuries, Zoology became an increasingly professional discipline, from the ancient to the modern era, although the concept of Zoology as a single coherent field arose much later. Zoological Sciences emerged from Natural History, reaching back to the work of scientific discipline. Naturalists began to reject essentialism and considered the importance of extinction and mutability of science.

ABOUT THE DEPARTMENT

Established: General: 2006, Honours: 2019
Courses: Semester wise 3 years degree course (under CBCS System) and 4 years degree courses (NEP 2020) under University of Calcutta.
Intake capacity: 13 (Honours/Major)
Intake capacity: 25 (Multidisciplinary)
Syllabus (NEP 2020- CCF)
Syllabus (UG-CBCS)

HISTORY OF THE DEPARTMENT

The department of Zoology came into existence in 2006 with the introduction of Bioscience course in Bachelor of Science (General) stream. To broaden the horizon of understanding about Biological Sciences, the college started B.Sc. (Honours) course in Zoology in 2019 under CBCS.

As Zoology deals with the study of different processes going on in animals, the course in Zoology encourages students to keep abreast of as many developments as possible in Animal Sciences. Studies in Classical Zoology deal with animal behavior, morphology, physiology, embryology, ecology, genetics etc. and provide solutions to agricultural, horticultural and environmental problems.

By the study of the fundamental details of animals, students can understand growth and development, reproduction, life cycle, medicinal values and economic importance of food resources. This course being an important component of Life Sciences offers immense opportunities in other related fields and applied disciplines such as Biochemistry, Biotechnology, Cell and Molecular Biology, Bioinformatics, Genomics, Agro-forestry, Environmental Science and Management and many others.

Recent advances in Zoology, which deal with the study of different processes going on in biological systems at the molecular level, have brought miraculous and revolutionary changes in the world of sciences. While studying Zoology, the students learn all these aspects of animals, including its applications. Besides, the students will have greater opportunities open to them in higher studies and research along with better job prospects. The department organises add-on courses, field trips and other co-curricular activities like wall magazines, webinars and so on.

FACULTY PROFILE

The Department of Zoology consists of two Guest Lecturers:

Name	Designation	Qualification	Joining date	Experience
Mr. Surajit Kumar Das	**Guest lecturer**	**M.Sc., B.Ed.**	**22.04.2022**	**2 yrs 10 months**
Ms. Susama Sing	**Guest lecturer**	**M.Sc., B.Ed.**	**24.07.2022**	**2 yrs 7 months**

Mr. Surajit Kumar Das

Surajit joined the department of zoology on 22nd April, 2022 as a Guest Lecturer. He completed his graduation with B.Sc. (Honours) in Zoology from Uluberia college in 2010 and M.Sc. from Vidyasagar University in the year of 2013. He completed his Bachelor of Education in 2011 under Calcutta University.

Along with academic activities and other necessary duties of the college he actively assists in various examination related duties. He played a significant role in organizing the Vermi Composting Project organized by the department of Zoology.

Area of Interest: His Area of interest lies in wild life conservation and animal behaviour.

Ms. Susama Sing

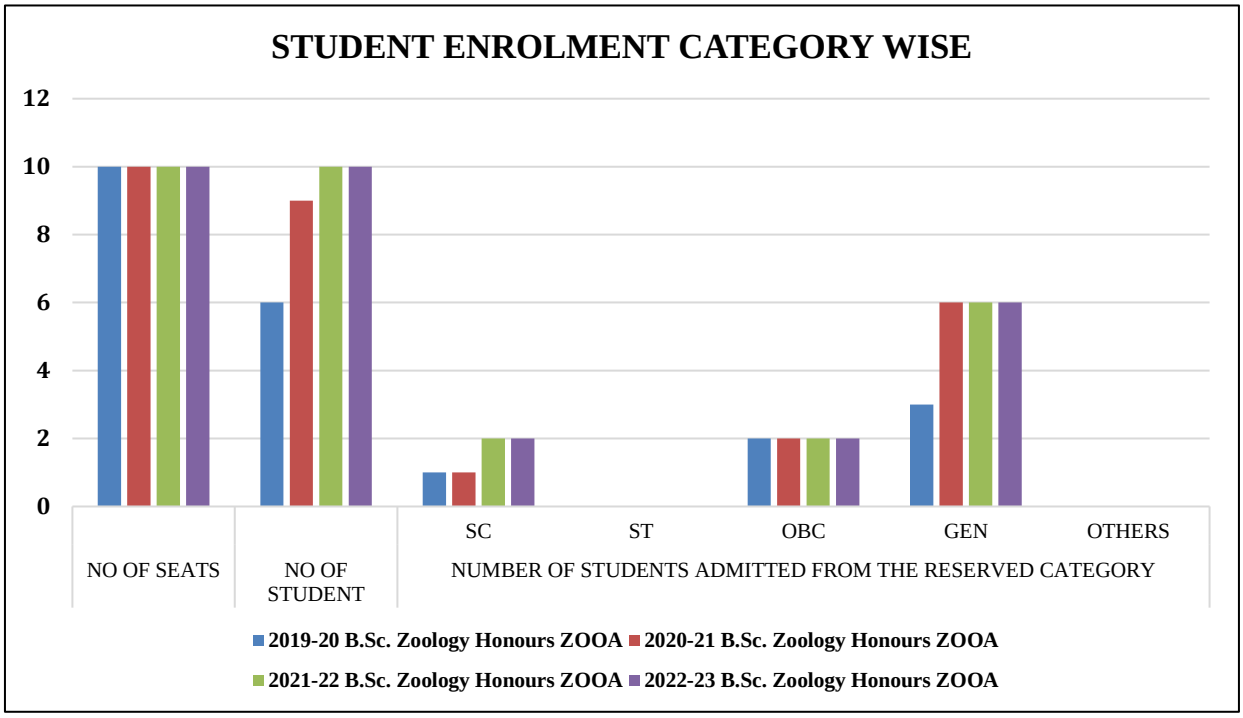
She joined the college on 24th July 2022 as a Guest Lecturer in the Zoology department. She passed B.Sc. (Honours) in Zoology from Calcutta University in the year 2018 and M.Sc in Zoology from Diamond Harbour Women's University in the year 2020. She has also completed B.Ed. in 2022 under WBUTTEPA.

Along with academic activities and other necessary duties of the college she actively assists in various examination related duties. She played a vital role in organizing the Vermi Composting Project organized by the department of Zoology. In the year 2016, she attended a national level seminar organised by UGC on "Discoveries in Chemistry those change the world". She qualified in the 26th WBCSC SET examination.

AREA OF INTEREST: Her area of interest lies in wild life conservation and animal behaviour.

STUDENTS' PROFILE

YEAR	PROGRAMME NAME	PROGRAMME CODE	NO. OF SEATS	NO. OF STUDENTS	NUMBER OF SEATS REMARKS FOR RESERVED CATEGORY AS PER GOI					NUMBER OF STUDENTS ADMITTED FROM THE RESERVED CATEGORY				
					SC	ST	OBC	GEN	OTHERS	SC	ST	OBC	GEN	OTHERS
2019-20	B.Sc. Zoology (Hons)	ZOOA	10	6	2	0	2	6	0	1	0	2	3	0
2020-21	B.Sc. Zoology (Hons)	ZOOA	10	9	2	0	2	6	0	1	0	2	6	0
2021-22	B.Sc. Zoology (Hons)	ZOOA	10	10	2	0	2	6	0	2	0	2	6	0
2022-23	B.Sc. Zoology (Hons)	ZOOA	10	10	2	0	2	6	0	2	0	2	6	0



LIST OF STUDENTS WITH PROGRESSION TO HIGHER STUDIES

Name	Session of Admission	Course and Institute where pursuing higher studies
Shrabani Gayen	2015	B.Ed.
Payel Naskar	2017	M.sc in Zoology
Jyoti Sankar Bhandari	2018	M.Sc. in Environmental Science
Jikhatha Purkait	2018	BBA in Hospital Management
Shreya Purkait	2018	B.Ed.
Piu Ghosh	2019	D.El.Ed.
Apurba Sardar	2019	D.El.Ed.
Anannya Halder	2019	DOPT (Diploma in Optomerty)
Anwesha Purkait	2019	D.El.Ed.

ALUMNI QUALIFIED IN COMPETITIVE EXAM

Name of Student	Session of Admission	Name of examination Qualified
Payel Naskar	2017	TET

PROGRAM SPECIFIC OUTCOMES

PSO1. Students will be able to develop arguments by collecting relevant information about the animals, so as to recognize their position in the classification systems and at phylogenetic level.

PSO2. Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.

PSO3. Students will be able to compare and contrast the characteristics of the different groups of animals such as Non-Chordata (Porifera, Cnidaria, Ctenofera, Platyhelminthes, Annelida, Arthopoda, Nematohelminthes, Mollasca, Echinodarmata) and Chordata (Hemichordata, Cephalochordata, Fishes, Amphibia, Reptilia, Birds, Mammals).

PSO4. Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth.

PSO5. Students will be able to explain how animals function at gene, genome, cellular and tissue level.

PSO6. Students will be will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems.

COURSE OUTCOMES

B.Sc. Zoology Honours

Semester – I

CC-1 Protists to Pseudocoelomates (Non-chordates-I)

CO1: Basics of animal classification
CO2: Understand the unique and general features protista and metazoa
CO3: To study evolution of symmetry and segmentation of metazoan.
CO4: General characteristics and classification upto classes of porifera and Cnidaria
CO5: Understand the conservation of coral and coral reefs.
CO6: Appreciate the parasitic adaptation in helminthes.
CO7: To study the life cycle and pathogenicity and control measures of Platyhelminthes and Nematoda.

CC-2 Molecular Biology

CO1: Understand the salient features of DNA, RNA types and function. Watson and Crick
CO2: Prove that Replication is semiconservative by directional and discontinuous
CO3: To study the mechanism of transcription in prokaryotes.
CO4: Mechanism of protein synthesis
CO5: Idea of Molecular Techniques.

Semester – II

CC-3 Coelomates (Non-Chordates-II)

CO1: Students will be able to understand general characteristics and classification up to classes annelida.
CO2: Understand the Respiration in prawn and cockroache, Metamorphosis in lepidopteran insects.
CO3: Understand the Social life in Termite.
CO4: Evolutionary significance of Onychophora.
CO5: General Characteristics of phylum Hemichordata, Relationship with non-chordates and chordates.

CC- 4 Cell Biology

CO1- Understand the unique and general features of Ultra structure and composition of plasma membrane, Fluid mosaic model, and transport across membrane.
CO2- To study the Structure and Function of ER, Golgi Apparatus, Lysosome.

CO3- Understand the Cytoplasmic Organelles (Mitochondria) structure and functions (Cytoskeleton and Nucleus).
CO4- To study cell cycle and its regulation. Concept of oncogenes and tumor suppressor genes with special reference to p53.
CO5- To Study Cell Signaling Transduction Pathways. Types of signaling molecules and receptors.

Semester – III

CC-5 Chordata

CO1: Understand the General characteristics and outline classification of phylum Chordata.
CO2: To give General Characteristics and classification of sub phylum Urochordata and Cephalochordata up to Classes.
CO3: Understand the accessory respiratory organ. Migration in fishes. Parental care in fishes. Swim bladder in fishes.
CO4: To Study the Adaptive Radiation in mammals with reference to locomotory appendages, Echolocation in Micro Chiropterans.

CC-6 Animal Physiology: Controlling and Co-ordinating System

CO1: Structure, Function, Location, Classification of Epithelial tissue, connective tissue, Muscular tissue, nervous tissue.
CO2: To give structure and types of bones and cartilages, Ossification.
CO3: Understand the structure of neuron, resting membrane potential.
CO4: To study Histology of different types of muscle, Characteristics of muscle fibre.
CO5: To study of histology of mammalian testis and ovary, Physiology of mammalian reproduction.
CO6: Understand the Histology and function of thyroid, pancreas, adrenal.
CO7: Classification of hormones. Types of hormone action.

CC- 7 Fundamental of Biochemistry

CO1: Students will learn the Structure and Biological importance Carbohydrates
CO2: Students learn structure and significant of lipids.
CO3: Students learn amino acids.
CO4: Structure of Nucleic Acids, Nucleic Acids Metabolism.
CO5: Students will learn Nomenclature and Classification og Enzymes.

SEC A - Apiculture

CO1: To study General morphology of Honey Bees and social organization of Bee colony
CO2: To study rearing of Bee and method of extraction of Honey
CO3: To study prevention and control measure of honey bee enemies and disease
CO4: To study the uses of apiary product
CO5: To study about bee keeping industry

Semester – IV

CC-8 Comparative Anatomy of Vertebrate

CO1- Students learn Structure and Function and Derivatives of integument in amphibians, birds and mammals.
CO2- To study the Comparative anatomy of Stomach and dentition of mammals.
CO3- General plan of Circulation, Comparative account of heart and aortiv arches.
CO4- To study Succession of kidney in different vertebrate groups.
CO5- Overview of axial and appendicular skeleton.

CC- 9 Animal Physiology: Life Sustaining System

CO1- Students Learn Structural Organisation and function of physiology of digestion.
CO2- Understand of Mechanism of Respiration, Respiratory volumes and Capacities.
CO3- Students Learn Physiology of Circulation, Heart, Thermoregulation & Osmoregulation and Renal Physiology.

CC- 10 Immunology

CO1- Understand the overview of Immune System, Innate and Adaptive Immunity.
CO2- Students learn the Antigens, Different types of Immunoglobulins, The Process of ELISA & RIA.
CO3- To Study the Major histocompatibility Complex, Types, properties and function of cytokines.
CO4- To study the Component and pathways of complement system.
CO4- Understand the Students Various types of Vaccine Active and Passive immunization.

SEC B - Aquarium Fisheries

CO1: To study the potential scope of Aquarium Fish industry
CO2: To study general characters and sexual dimorphism of fresh water and marine aquarium fishes
CO3: To study live fish transport and life fish feed
CO4: To study Maintenance of Aquarium

Semester – V

CC-11 Ecology

CO1- To study the introduction to ecology.
CO2- Understand the Ecosystem, types of ecosystems, food web, food chain, Energy flow.
CO3- The study of applied ecology, types and level of biodiversity and wildlife conservation, Indian wild life act & schedule.
CO4- Students learns the Population, Community, Demographic factor, life table and fecundity table.

CC-12 Principle of Genetics

CO1- Understand the Mendelian Genetics and its Extension, priciples of inheritance, and different types of term of genetics.
CO2- To the study of linkage, crossing over and Linkage Mapping and sex linkage drosophila.
CO3- To the study of gene mutations, types of chromosomal aberrations and biochemical mutation detection in Neurospora.
CO4- Understand the sex determination of man, Drosophila, Extra chromosomal inheritance,
CO5- Understand the Transposable Genetic Elements.

DSE-A Parasitology

CO1- Understand the introduction to Parasitology, brief introduction of parasitism, parasite, parasitoid, and vectors.
CO2- To the study of parasitic protists, study of morphology, life cycle prevalence, epidemiology, Pathogenicity, diagnosis, prophylaxis, and treatment of Giardia Intestinalis, Trypanosoma gambiense, Schistosoma harmatobium, Taenia solium, Ascaris lumbricoidis, Ancylostoma duodenale, Wuchereria bancrofti.
CO3- Understand the Nematode plant interaction, and parasitic arthropods, & parasitic vertebrates.

DSE-A Endocrinology

CO1- To the study of introduction of endocrinology, general idea of endocrine system, and hormones.
CO2- Understand the structure and function of hypothalamus and hypothalamic nuclei, Regulation of neuroendocrine glands, feedback mechanism.
CO3- Understand the peripheral endocrine glands.
CO4 - To the study of Regulation of hormone action, Estrous cycle in rat and menstrual cycle in human.
CO5- Understand the non-mammalian vertebrate hormone.

Semester – VI

CC-13 Developmental Biology

CO1- To the study of Early Embryonic Development, Gametogenesis, spermatogenesis, Oogenesis etc.
CO2- To the study of late embryonic development, extra embryonic membranes in chick, implantation of embryo in humans, placenta.
CO3- Students learns the post embryonic development, Development of brain and eye in chick.
CO4- Understand the implications of developmental biology.

CC-14 Evolutionary Biology

CO1- Understand the Origin of life, RNA world hypothesis.
CO2- Understand the historical review of evolutionary concepts, Lamarckism, Darwinism, and neo-Darwinism.
CO3- To study of geological time scale, Fossil types and age determination by carbon dating, evolution of horse.
CO4- Understand the natural selection, Modes with examples.
CO5- Understand the Species Concept, Origin and evolution of man, population genetics, extinction, phylogenetic trees.

DSE-A Animal Biotechnology

CO1- To the study of organization of E. Coli Drosophila genome.
CO2- Understand the molecular techniques in gene manipulation.
CO3- Understand the genetically modified organism.
CO4- Understand the Culture Techniques and application.

DSE-B Animal Behavior and Chronobiology

CO1-Understand the patterns of Behavior.
CO2- To the study of social and sexual behavior.
CO3- Understand the Chronobiology and biological Rhythm.

COURSE OUTCOMES

B.Sc. Zoology General

Semester – I

CC-1 Animal Diversity

CO1: General character and classification up to classes of Protista, Porifera and Cnidaria
CO2: To study life history of Taenia Solium, Ascarias, and their adaptation
CO3: Study Metamerism process in Annelida , Metamorphosis in Lepidoptera
CO4: To study General character and classification of Arthropoda ,Mollusca, Ecinodermata.
CO5: Study the Respiration process in pila,Vater vascular system in Asteroidea
CO6: To study feeding mechanism in Amphioxus,osmoregulation in fishes,Biting mechanism of snake
CO7: Study the parental care in Reptiles,Flight adaptation in bird and structure of Hair,Horn,Nail.

Semester – II

CC-2 Comparative Anatomy and Developmental Biology

CO1 Study the integument of Bird and mammals
CO2: Study the structure of Gills lungs, air sacs and swim bladder
CO3: Study the Evolution of heart and aortic arches,urino -genital ducts
CO4: Study Gametogenesis process, fertilization and clevage process
CO5: Study Metamorphic events in frog life cycle and their hormonal regulations

Semester – III

CC-3: Physiology and Biochemistry

CO1: To study the structure of Neuron and skeletal muscle and chemical basis of muscle contraction
CO2: Study the transport process of oxygen and carbon
CO3: Study the mechanism process of urine formation, Countercurrent Mechanism, cardiac cycle
CO4: Study the histology structure of Testis, Ovary, Pituitary, Thyroid, Pancreas and their functions
CO5: study Glycolysis, Krebs cycle Ets, urea cycle
CO6: Enzyme classification and their factor

SEC-A (1): Apiculture

CO1: Study classification and Biology of Honey bee colony and methods of Extraction of Honey
CO2: Study prevention and control Measures Diseases and Enemies of Honey
CO3: Study the product of Apiculture and their uses
CO4: Study about Bee keeping industry

Semester – IV

CC-4: Genetics and Evolutionary Biology

CO1: Study the principal of inheritance, linkage process
CO2: Study about chromal mutation, Genic balance theory of Drosophila
CO3: Study origin of life and evolutionary theories
CO4: Study mechanism of isolation and speciation

SEC B-1 Aquarium Fish keeping

CO1: To study the potential scope of Aquarium fish industry
CO2: Study common characters and sexual dimorphism of fresh and Marine Aquarium fishes
CO3: Study fish transport process
CO4: To study General Aquarium maintenance

Semester – V

DSE A (1) Applied Zoology

CO1: To study host parasite Relationship
CO2: Study Life history and Pathogenecity of Entamoeba, Plasmodium,Wuchereria ,Alcylostoma
CO3: To study Economic nd medical importance of Insect
CO4: To study preservation and artificial insemination of of cattle
CO5: Study the breeding process pf cattle
CO6: Study Induced breeding process and transportation process of fish seed

Semester – VI

DSE B (2) Ecology and Wild Life Biology

CO1: To study about ecology and factor effect in ecosystem
CO2: Study about attribution of population, survivorship curves and population regulation
CO3: To study characteristics of community
CO4: To study about Ecosystem
CO5: To study wild life conservation process and tiger conservation

DEPARTMENTAL ACTIVITIES

We, the faculty members of Zoology are upholders of knowledge and that is why, in a well-disciplinary rhythm, we are nurturing our students and trying to help them reach a bright future. We believe in education that focusses not only on academic achievements but also nurtures the potential of an individual in all aspects. Our Zoology subject is related to nature. We are trying to build a close relationship with nature and students through our departmental activities.

DEPARTMENTAL MEETINGS

Departmental meeting are held from time to time to evaluate academic progress and to formulate the policies for the betterment of the department. However, in a small department like ours, departmental faculty members are always in process of interaction and settle day to day affairs between themselves.

ACADEMIC ACTIVITY

Through the entire academic session, the department of Zoology undertakes various educational activities related to the curriculum like students' evaluation, question paper setting, condicting internal examinations, practicals and result publication.

Apart from these, various co-curricular activities are also organised. We present here some of our departmental activities:

- Poster Presentation Competition
- Field Tour
- Vermicomposting Project

POSTER PRESENTATION COMPETETION

The deparment of Zoology of Gour Mohan Sachin Mandal Mahavidyalaya organized a poster presentation competition on 04/01/2023 at 1.50 P.M. Altogether,15 participants ranging from students, teachers, actively participated in the programme. There has been positive feedback from the participants. Active and enthusiastic participation of the audience is overwhelming.

Educational importance: The poster competition provided an easier way to absorb information for those more comfortable with pictures than words. It's an effective way for students to draw and maintain their attention on topics and to maintain their interest. Posters are used to motivate students to learn specific topics. Posters help learners to focus on a certain idea, event, fact or process. This can make it even more effective to facilitate learning. Posters can have quite a positive effect on the process of learning. The best advantage of poster making is that it facilitates team work and understanding along with facilitating creative thinking and extensive research and reading.

FIELD TOUR

Field tours are an integral part of the study of Zoology. It helps students connect with nature. As Zoology is the study of animal kingdom, it is necessary to study the habit and habitats of animals and their behavioral activity. Every year we organize field tours, which is included in our syllabus.

VISIT TO A LOCAL ZOOLOGICAL GARDEN: FIELD STUDY.

Place: Zoological Garden, Alipore, Kolkata, West Bengal

The Department of Zoology of Gour Mohan Sachin Mandal Mahavidyalaya organized a local field study to the Zoological Garden, Alipore, Kolkata, West Bengal on 17/12/2022. Altogether 20 participants ranging from students and 2 departmental teachers visited the local area of Alipore zoo

Educational importance: It is a place where a variety of Animal species are identified. It helps in taxonomic study. It provides the public with information about species of animal. Students observed animal species and identified them from the study site. The students studied the natural habitats and characters of the animal found in the area. The major objective was to familiarize the students with the fauna & ecology of the region. Also, to acquaint them with the importance of fauna of forest area and the threats these ecosystems face due to natural and Anthropogenic pressures. For students, visiting the Zoological Garden led to stress relief and relaxation and the value of improved quality of life.

FIELD STUDY – DARJEELING & MIRIK

Place: Darjeeling and Mirik

The Department of Zoology of Gour Mohan Sachin Mandal Mahavidyalaya organized a visit for a field study, at Darjeeling and Mirik from 27/04/2023 to 30/04/2023. Altogether 24 participants ranging from students and 2 departmental teachers visited the area.

Educational importance: It is a place where a variety of animal species were identified. It helps in taxonomic study. It provides the public with information about local species of animal. Students observed animal species and identified them from the study site. The students studied the natural habitats and characters of the animals found in the area. The major objective was to familiarize the students with the fauna & ecology of the region. Also to acquaint them with the importance of fauna of forest area and the threats these ecosystems face due to natural and anthropogenic pressures.

VISIT TO A POULTRY FARM

The Department of Zoology of Gour Mohan Sachin Mandal Mahavidyalaya organized a visit to a local field study, Poultry farm Semester I MDC student on 08/02/2024 Altogether 8 participants ranging from students and 2 deparmental teachers visited a local Poultry farm

VERMI COMPOSTING PROJECT

Vermicoposting is the product or process of composting using various worms usually earthworm red wigglers to create a heterogeneous mixture of decomposing vegetables or food waste bedding and vermicast. It is also called worm casting. It is the end product of the breakdown of organic matter by an earthworm

ACTIVITIES OF STUDENTS

The students of the department of Zoology engage in various creative programs organized by the department along with their course of study .Our department gives them a wonderful opportunity to express their talent, their creativity and their intelligence .In our department we organize various co-curricular programs which are held every year.Details of our students activities are in brief as follows.

- Engage in co-curricular activities
- Participation in field Excursion

ENGAGE IN VARIOUS CO-CURRICULAR ACTIVITIES

Our department teachers encourage the student to involve in co- curricular activities besides syllabus oriented education. Students of our department praticipate in college sports, cultural programmes, debate, music competition etc. Some of them have done well and have given bright performances. We feel proud of them and encourage their creative talent to get exposure in such a way.

PARTICIPATION IN FIELD EXCURSION

Student of our department every year praticipate in field study included their syllabus.we visit zoological Garden,Alipore, Darjeeling and Mirik , Poultry farm.

DEPARTMENTAL LIBRARY

"The only thing
You absolutely have to know
Is the location of the library"
– Albert Einstein

The departmental library of Zoology comprises of 15 books.
There are test books as well as various reference book by various authors.

LABORATORY FACILITIES

A. LIST OF INSTRUMENTS

- Binocular microscope
- Simple microscope
- Compound microscope
- Colorimeter
- Centrifuge
- Pan balance
- Digital balance
- Burette with stand
- Necessary glass wares

B. LIST OF CHEMICALS

- Phenolphthalein
- Chloroform
- Bouins
- Alcohol
- Manganous sulphate
- Concentrated sulphuric acid
- Hydrochloric acid (HCL)
- Potassium hydroxide (kOH)
- Starch solution
- Phenolphthalein solution

SWOC ANALYSIS

STRENGTHS	**WEAKNESSES**
• Committed and dedicated faculty members • "Small is beautiful" – we firmly believe that we may be a small department but we can and we will excel in all spheres.	• Lack of advance laboratory equipment • Lack of spacious classroom • Lack of proper Laboratory • Lack of books in the departmental library
OPPORTUNITIES	**CHALLENGES**
• Genuine interest in bio-sciences among students of the area • Developing our facilities can lead to an exponential growth in the study of Zoology in our college • More emphasis can be given on practical and field study and subject-related project work in applied biological field. • More subject related seminars my be organised	• To create awareness and scientific temper among rural students • To overcome the socio-economic limitations of the region

Lesson Plan

SEMESTER - 1

Paper Code :- CC1

TOPIC NAME	TEACHERS NAME	NO OF CLASSES (IN HOURS)
Non - Chordates 1:- protists to pseudocodelomates (TH)		**50**
Basics of animal classification	**Susama Sing**	**4**
Protista and Metazoa General characteristics and classification upto phylum, locomotion inEuglena, Paramoecium, and amoeba, Conjugation in paramoecium, life cycle and pathogen city of plasmodium vivax and Entamoeba Histolytica Metazoa **Evolution of symmetry and segmentation of Metazoa**	**Do**	**15**
Porifera	**Do**	**6**
Cnidaria	**Do**	**10**
Cetnophera	**Do**	**2**
Platyhelminthes	**Do**	**6**
Nematoda	**Do**	**7**
Non Chordates 1:- Protist to pseudocoelomates (PR) **Study of whole mount of Euglena, Amoeba, and Paramoecium Identification with reason & Systemic position of amoeba, Euglena, Entamoeba, paramecium, Plasmodium, Balantidium, Vorticela Identification with reason & Systemic position of Sycon, Poterion, Obelia, Physalia, Aurelia, Gorgonia, Metridium, Pennatula, Madrepora, Fasiola hepatica, Taenia solium, and Ascaris lumbricoidis Staining /Mounting of any protozoa/ helminths from gut of Periplaneta sp.**		**60**

Paper Code :- CC2

TOPIC NAME	TEACHERS NAME	NO. OF CLASSES (IN HOURS)
Molecular Biology (TH)		50
Nucleic Acids	Surojit Kumar Das	3
DNA Replication	Do	9
Transcription	Do	9
Translation	Do	9
Post Transcriptional Modifications and Processing of Eukaryotic RNA	DO	8

Gene Regulation	Do	7
DNA Repair Mechanism	Do	2
Molecular Techniques	Do	3
Molecular Biology (PR) Demonstration of polytene and lampbrush chromosome from photograph Isolation and quantification of genomic DNA from goat liver Agarose gel electrophoresis for DNA Histological staining of DNA and RNA in prepared slides		60

SEMESTER: 2

Paper Code : CC3

TOPIC NAME	TEACHERS NAME	NO. OF CLASSES (IN HOURS)
Non - Chordates 2 - Coelomates		50
Introduction :- Evolution of Coelom	Susama Sing	2
Annelida	Do	10
Arthopoda	Do	16
Onychophora	Do	2
Mollusca	Do	10
Echinodermata	Do	8
Hemichordata	Do	2
Non - Chordates 2 (PR)		
Study of following specimens A. Annelida B. Arthopoda C. Molluscs D. Echinoderms 2. Anatomy Study: Nervous System, Reproductive System (male & female), Mouth parts and Salivary apparatus in Periplaneta sp.		60

SEMESTER:2

Paper Code: CC4

TOPIC NAME	TEACHER'S NAME	NO. OF CLASSES
Cell Biology		50
Plasma Membrane	Surojit Kumar Das	7
Cytoplasmic Organelles 1	Do	5
Cytoplasmic Organells 2	Do	7
Cytoskeleton	Do	5
Nucleus	Do	8
Cell Cycle	Do	10
Cell Signalling	Do	8
Cell Biology (PR)		60
1. Preparation of temporary stained squash of onion/ arum root tip to study various stages of mitosis. 2. Study of various stages of meiosis from grasshopper testis. 3. Preparation of permanent slide to show the presence of Barr body in human female blood cells / cheek cells. 4. Preparation of permanent slides to demonstrate :- A. DNA by Feulgen reaction B. Cell viability study by Trypan Blue Staining.		

SEMESTER: 3

Paper Code: CC6

TOPIC NAME	TEACHERS NAME	NO. OF CLASSES
Animal Physioloy : Controlling and Co - ordinating System		50
Tissue	Surojit Kumar Das	4
Bone and Cartilage :- structure and type of bone and cartilage, Ossification	Surojit Kumar Das	4
Nervous System	Surojit Kumar Das	10
Muscular System	Surojit Kumar Das	10
Reproductive System	Surojit Kumar Das	6
Endocrine System	Surojit Kumar Das	16
Animal Physiology :- Controlling and Co - Ordinating System (PR) 1) Recording of cardiac and simple muscle twitch with electrical stimulation. 2) Preparation of temporary mounts :- Squamous epithelium,	Surojit Kumar Das	60

striated muscle fibres and nerve cells. 3) Study of permanent slides :- mammalian skin, spinal cord, pancreas, testis, ovary, adrenal gland, lung, pyloric stomach, cardiac stomach, thyroid, samm intestine and large intestine of mammals (white rat) Microtomy :- Preparation of parmanent slide of any five mammalian (goat / rat) tissue.		

SEMESTER: 3

Paper Code: CC7

TOPIC NAME	TEACHERS NAME	NO OF CLASSES
Fundamentals of Biochemistry		50
Carbohydrates	Susama Sing	8
Lipids	Susama Sing	7
Proteins	Susama Sing	10
Nucleic Acids	Surojit kumar Das	10
Enzymes	Surojit Kumar Das	13
Oxidative Phosphorylation	Surojit Kumar Das	2
Fundamentals of Biochemistry (PR)		60
1) Qualitative test for Carbohydrates, Protein, Lipids 2) Qualitative estimation of urea and uric acids	Susama Sing	
3) Paper Chromatography of Amino Acids 4) Quantitative estimation of water soluble proteins following Lowry Method	Surojit Kumar Das	

SEMESTER: 3

Paper Code: SEC - A (1)

TOPIC NAME	TEACHERS NAME	NO. OF CLASSES
Apiculture		30
Biology of Bees	Surojit Kumar Das	2
Rearing of Bees	Surojit Kumar Das	14
Diseases and Enemies	Susama Sing	6
Bee Economy	Susama Sing	2
Entrepreneurship in Apiculture	Surojit Kumar Das	6

SEMESTER: 4

Paper Code: CC8

TOPIC NAME	TEACHER'S NAME	NO OF CLASSES
Comparative Anatomy of Vertrebrates		50
Integumentary System Structure, function and derivatives of integument in amphibian, birds, and mammals	Susama Sing	10
Respiratory System Respiratory organ in fish, birds, mammals	Susama Sing	6
Digestive System Comparative anatomy of stomach, dentition in mammals	Susama Sing	6
Circulatory System General plan of circulation, comparative account of heart and aortic arches	Susama Sing	7
Urogenital System Succession of kidney in different vertebrate group, evolution of urogenital ducts	Susama Sing	5
Nervous System and Sense Organ Comparative account of brain in vertebrates, cranial nerves, olfactory and auditory receptors in vertebrates	Susama Sing	8
Skeletal System Overview of axial and appendicular skeleton limbs, girdles of pigeon, jaw suspension in mammals	Susama Sing	8
Comparative Anatomy of Vertebrates (PR)		60
1) Study of placoid, cycloid, ctenoid scales through permanent slides/photographs 2) Study of disarticulated skeleton of toad, pigeon, Guineapig,	Susama Sing	
3) Comparative study of heart, and brain, with the help of model / picture 4) Identification of skulls :- pigeon, one herbivores and one Carnivore	Susama Sing	

SEMESTER: 4

Paper Code: CC9

TOPIC NAME	TEACHER'S NAME	NO OF CLASSES
Animal Physiology: Life Sustaining System		50

Physiology of Digestion Structural organization and function of gastro intestinal tract, Mechanical and chemical digestion of food absorption of carbohydrates, lipids, and protein in human	Surojit Kumar Dad	10
Physiology of Respiration Mechanism of Respiration, Respiratory volumes and capacities, transport of oxygen and carbon di oxide in blood	Do	10
Physiology of Circulation Structure and Function of haemoglobin, blood clotting system, Hematopoiesis, basic step and its regulation, ABO blood groups	Do	8
Physiology of Heart Coronary circulation, structure and working of conducting myocardial fibres, Origin and Conduction impulses, Cardiac Cycle and Cardiac output	Do	6
Thermoregulation And Osmoregulation Thermal regulation in camel and polar beer, Osmoregulation of aquatic vertebrated	Do	8
Renal Physiology Structure of kidney and its functional unit, Mechanism of urine formation Regulation of acid base Balance	Do	8
Animal Physiology :- Life Sustaining System (PR)		60
1) determination of ABO blood group 2) Estimation of haemoglobin 3) Identification of blood cell from human blood 4) Preparation of haemin crystals and haemochromogen crystal	Surojit Kumar Das	
5) Identification of blood cells from cockroach harmolymph 6) Demonstration of blood pressure by digital meter	Do	

SEMESTER: 4

Paper Code: CC10

TOPIC NAME	TEACHERS NAME	NO OF CLASS IN HOURS
Immunology		50
Overview of immune System Introduction concept of health and disease, Cells and Organs of the immune System	Surojit kumat Das	3
Innate and Adaptive Immunity	Do	9
Anatomical barriers, inflammation, cell and molecules involved in innate immunity, Adaptive immunity		
Antigens Antigenicity and immunogenecity, immunogens, Adjuvants, and haptens, Factors influencing immunogenecity, B and T cell receptor	Do	6
Immunoglobins Structure and function of different classes of immunoglobulin, antigen antibody reaction, ELISA, RIA	Do	10
Major histacompatibility complex Structure and function of MHC complex, structure of T cell Receptor and its Signalling, Tcell development and selection	Susama Sing	6
Cytokines Types, properties, and function of cytokines	Susama Sing	3
Complement System Components and pathway of complement activation	Susama Sing	5
Hypersensitivity Gell and coombs classification and brief description of various type of hypersensitivity	Susama Sing	4
Vaccines Various type of vaccine, Activeand passive immunization	Susama Sing	4
Immunology (PR)		60
1) demonstration of lymphoid organs 2) Histological study of Bursa fabricius spleen thymus, and lymph nodes through photographs Demonstration of ELISA	Susama Sing Surojit Kumar Das	

SEMESTER: 4

Paper Code: SEC - B (1)

TOPIC NAME	TEACHERS NAME	NO OF CLASSES (IN HOURS)
Aquariam Fish Keeping		30
Introduction to Aquariam Fish Keeping	Susama Sing	2
Biology of Aquariam Fishes	Susama Sing	10
Food and Feeding of Aquariam fishes	Surojit Kumar Das	8
Fish Transportation	Surojit Kumar Das	5
Maintenance of Aquariam	Surojit Kumar Das	5

SEMESTER: 5

Paper Code: CC11

TOPIC NAME	TEACHERS NAME	NO OF CLASSES (IN HOURS)
Ecology (TH)		50
Introduction of Ecology Autecology and Synecology, levels of organization, laws of limiting factots, study of physical factors, The biosphere	Susama Sing	4
Population Unitary and modular population, unique and group attributes of population, Demographic factor, life table, fecundity table, Survivorship cruve, Dispersal of Dispetsion, Geometric, Exponential and logistic growth, eqation and pattern, r and k Strategy	Susama Sing	20
Community Community characters, species diversity, abundance, dominance, richness stratification, Ecotone and edge effect, Ecological Succession with one example	Susama Sing	11
Ecosystem Type of ecosystem with an example in details, food chain, Detritus and grazing food chain, Linear and y shaped food chain, food web, Energy flow, Ecological pyramid's and Ecological efficiencies, Nitrogen Cycle	Susama Sing	8
Applied Ecology Type and level biodiversity, Mega diversity countries, Biodiversity hot spot, Flagship Species, Keytone Species, wildlife conservation	Susama Sing	7
Ecology (PR)		60

1) determination of population density in natural / hypothetical community by quadrate method and calculation shannon weiner diversity index for the same community 2) study of an aquatic ecosystem 3) Report on a visit to National park / Biodiversity park / Wild life Sanctuary / Zoological Garden	Susama Sing	
SEMESTER: 5 **Paper Code: CC12**		
TOPIC NAME	TEACHES NAME	NO OF CLASS (IN HOURS)
Principles of Genetics		50
Mendelian Genetics and its Extension	Surojit kumas Das	12
Linkage, Crossing over and Linkage Mapping	Surojit kumar Das	8
Mutation Type of mutation, type of chromosomal aberrations, Varriation of chromosome number, Non disjunction of X chromosome in Drosophila	Surojit kumar Das	12
Sex Determination Mechanism of sex determination in Drosophila and in man, Dosage Compensation in Drosophila and human Extra chromosomal Inheritance Kappa particles in Paramoecium, shell spiralling in snaill	Surojit kumar Das	8
Genetic Fine Structure Complementation test Bacteriophage	Surojit kumar Das	4
Transposable Genetic Elements IS elements in Bacteria, Ac - Ds elements in maize and P elements in Drosophila, LINE, SINE, Alu elements in human	Do	6
Principle of Genetics (PR)		60
1) Chi Square analyses for genetic ratio test 2) Identification of chromosomal abberration in Drosophila and man from photographs Pedigree analysis of some inherited traits in animals	Surojit kumar Das	
SEMESTER: 5 **Paper Code: DSE A (1)**		
TOPIC NAME	TEACHERS NAME	NO OF CLASS (IN HOURS)
Parasitology		50
Introduction to Parasitolog Brief introduction of parasitism, parasite, parasitoid, and vectors host parasite interaction	Susama Sing	2
Parasitic Protists Study of morphology, life Cycle, prevalence, Epidemiology,	Susama Sing	12

Pathogenecity, Diagnosis, Prophylaxis and Treatment of Giardia Intestinalis, Trypanosoma gambiense		
Parasitic platyhelminthes Study of morphology, life cyclr, prevalence, Epidemiology, Pathogenecity, Diagnosis of Schistosoma sp, Taenia solium	Susama Sing	12
Parasitic Nematodes Study of morphology, life Cycle, prevalence, Epidemiology, Pathogenicity, Diagonis of Ascaris lumbricoidis, Ancylostoma duodenale, Wuchereria bancrofti	Susama Sing	12
Parasitic of Arthopods Biology importance and controls og ticks, soft ticks, Hard ticks, mites, Lice, Flea, and Bug	Susama Sing	10
Parasite of Vertebrates Cookicutter Shark, Hood Mocking bird, Vampire bats their parasite behavior and effect on host	Susama Sing	2
Parasitology (PR)		60
1) Study of life Stages of Giardia Intestinalis, Trypanosoma gambiense, Leishmania donovani, Plasmodium vivax, through permanent slides. 2) study of adult and life stages of Schistosoma sp, Taenia solium, through permanent slides Study of adult and life stages of Ancylostoma duodenale through permanent slides/ micro photographs	Susama Sing	

SEMESTER :- 5

Paper Code :- DSE B (1)

TOPIC NAME	TEACHERS NAME	NO OF CLASS (IN HOURS)
Endocrinology		50
Introduction of Endocrinology General idea of endocrine system, classification, Characters and transport of hormone,	Surojit Kumar das	6
Hypothalamo - Hypophysal Axis Structure and function of hypothalamo and hypothalamic nuclei, Regulation og neuroendocrine glands, feedback mechanism and hypothalamo and Hypophysal Gonadal Axis, structure of pituitary gland, hormones and their function, hypothalamo and Hypophysal portal system	Surojit kumar Das	12
Peripheral Endocrine Gland Structure and function hormones of Thyroid gland, parathyroid, adrenal, pancreas, ovary and Testis, Disorder of endocrine gland	Surojit kumar Das	12

Regulation of Hormone Action Mechanism of action of steroidal, non steroidal hormones with receptor, calcium and glucose homeostasis in mammals, Bioassay of hormone using RIA & ELISA	Surojit kumar Das	12
Nn Mammalian Vertebrates Hormones Function of Prolactin in fishes, amphibians, birds Function of Melanotropin in teleost fishes, amphibians, Reptiles	Surojit kumar Das	8
Endocrinology (PR)		60
1) Dissect and Display of Endocrine glands in laboratory bred rat 2) study of the permanent slides of all the endocrine glands 3) Tissue Fixation, embedding in paraffin, microtomy and preparation of any endocrine gland 4) H - E staining of Histological Slides.	Surojit kumar Das	

SEMESTER :- 6

Paper Code: CC13

TOPIC NAME	TEACHERS NAME	NO OF CLASSES
Developmental Biology		50

Early Embryonic Development Gametogenesis, spermatogenessis, Oogenesis, type of eggs, egg membrane, Fertilization in sea urchins and mammals, planes and pattern of cleavages, type of blastula, fate map,	Susama Sing	20
Late Embryonic Development Extra embryonic membrane in chick Implantationof embryo in humans placenta	Susama Sing	10
Post Embryonic Development Development of brain and eye in chick, Molecular induction of brain and eye development	Susama Sing	8
Implications of Developmental Biology IVF, Stem cell, Concept of potency, markers, application of stem cell therapy in bone marrow.	Susama Sing	12
Develpomental Biology (PR)		60
1) study of whole mounts of develpomental stages of chick embryo through permanent slides. 2) study of the developmental stages and life cycle of Drosophila 3) study of different section of placenta 4) Identification of invertebrates larva through slides/ photographs.	Susama Sing	

SEMESTER: 6

Paper Code: CC14

TOPIC NAME	TEACHERS NAME	NO OF CLASS (IN HOURS)
Evolutionary Biology		50
Origin of life RNA world hypothesis	Surojit kumar Das	5
Historical review of evolutionary concept, Lamarkism, Darwinism, and Neo Darwinism	Do	5
Geological time scale, Fossils, type and age determination by carbon dating, Evolution of horse	Do	6
Natural selection, modes with example	Do	6
Species concept, isolating mechanism, modes of speciation,	Do	10
Origin and evolution of man, unique hominid characters.	Do	2
Population genetics	Do	10
Extinction, back ground and mass extinction, detailed examples of K T extinction	Do	3
Phylogenetic tree, construction and interpretation of phylogenetic tree, tree using persimony, convergent, and divergent evolution	Surojit kumar Das	5
Evolutionary Biology (PR)		60
1) Study of fossils from models, Dickinsonia, paradoxides, asteroceras, pentermites, ichthyosaur, Archaeopteryx 2) study of homology and analogy from suitable specimens 3) phylogenies tree, construction and interpretation of phylogenetic tree using persimony, construction of dendrogram following Priciples of phenetics and cladistics from data table.	Surojit kumar Das	

SEMESTER: 6

Paper Code: DSE A (1)

TOPIC NAME	TEACHERS NAME	NO OF CLASS (IN HOURS)
Animal Biotechnology		50
Introduction Organization of E. Coli and Drosophila genome	Susama Sing	5

Molecular Techniques in Gene manipulation Recombinant DNA technology Restrictions endonuclease, cloning vector, plasmid, phage vector, cosmids, HAC shuttle Vector	Susama Sing	23
Genetically Modified Oraganism Production of cloned and transgenic animals, nuclear transplantation, Retroviral method, microinjection	Susama Sing	12
Culture Techniques and Application Animal cell Culture, Expressing cloned genes in mammalians cells, molecular diagonosis, genetic diseases, Dolly and Polly cloning, Genetically modified economically important animal, Gene Therapy	Susama Sing	10

Animal Biotechnology (PR)		60
1) Genomic DNA isolation from E. Coli and plasmid DNA isolation	Susama Sing	
2) To study following techniques through photographs southern blotting, Northern blotting Western blotting, PCR, DNA fingerprinting 3) Project report on animal cloning and application and ethical issues	Susama Sing	

SEMESTER: 6

Paper Code: DSE B (1)

TOPIC NAME	TEACHERS NAME	NO OF CLASS (IN HOURS)
Animal Behaviour and Chronobiology		50
Pattern of Behavior Stereotypes Behaviour individual behavior pattern, Instinct vs. Learned Behavior, FAP Associate learning, Classical and operant conditioning,	Surojit kumar Das	10

Social and Sexual Behavior Social organization in termites, communication, social behavior altuism, selfishness, sexual behavior, sexual dimorphism, mate choice in peacock, intra sexual selection, kinship theory, Relatedness and inclusive fitness parental care	Surojit kumar Das	20
Chronobiology and Biological Rhythm Types and characteristics of biological rhythms, short and long term rhythm, circadian rhythm, Tidal rhythm, Lunar rhythms, photic and non photic zeitgebers, role of melatonin, biological clock	Surojit kumar Das	20
Animal Behavior and Chronobiology (PR)		60

1) To Study nests and nesting habitat of the birds and social insects 2) To study the behavior response of wood lice to dry and humid conditions 3) To study geotaxis behavior in earthworm	Susama Sing	
4) To study phototaxis behavior in insect larva 5) visit to forest /wild life sanctuary / biodiversity park/ to study behavior activities of animals and prepare Short report. 6) Study of circadian function in human.		

B.Sc. Zoology (General)

Lesson Plan

SEMESTER-I

Paper code- CC1/GE1

Topic/Chapter Name	Name of the Teacher/Teachers	No of class(in hours)
Animal Diversity	Susama sing	50 hours
Unit-1 kingdom protista	Susama sing	2 hours
Unit-2 Phylum Prorifera	Do	2 hours
Unit -3 Phylum Cnideria	Do	2hours
Unit-4:Phylum Platyhelminthes	Do	2 hours
Unit-5 Phylum Nemathelminthes	Do	2 hours
Unit-6 Phylum Annelida	Do	4 hours
Unit -7 Phylum Arthropoda	Do	4 hours
Unit -8 Phylum Mollusca	Do	2 hours
Unit-9 Phylum	Do	4 hours
Echinodermata		
Unit-10 Protochordates	Surajit Kumar Das	2 hours
Unit-11 Agnatha	Do	2 hours
Unit-12 Pisces	Do	4 hours
Unit -13 Amphibia	Do	4 hours
Unit -14 Reptiles	Do	4 hours
Unit -15 Aves	Do	4 hours
Unit -16 Mammals	Do	4 hours
Identify the specimen and study the Anatomy	S.K.D & S.sing	60 hours
1.Identify the specimen	S.K.D	25 hours
2. Key Identification of Poisonous and non poisonous snakes	S.sing	5 hours
3.Anatomy of female Cockroach	S..k D & S.sing	30 hours

SEMESTER-II

Paper Code- CC2/GE2

Topic/Chapter Name	Name of the Teacher/Teachers	No of classes
Comparative Anatomy and Development Biology	S.K.D & S.Sing	50 hours
1.Integumentary system	S.sing	4
2.Digestive system	Do	4
3.Respiratory system	Do	6
4.Circuculatory System	Do	6
5.Urino-genetial system	S.k.D	6
6.Erly Embryonic Development	Do	14
7.Late Embryonic Development	Do	10
Comparative Anatomy and Development Biology Lab	S.K.D &S.Sing	60 hours
1.Osteology	S.k.D	20 hours
2.Larvak stage	Do	10 hours
3.Study of different types of placenta	S.sing	15 hours
4.Development stage of Chick embryo	Do	15 hours

SEMESTER-III

Paper Code- CC3

Topic/Chapter Name	Name of the Teacher/Teachers	No of class(in hours)
Physiology and Biochemistry	S.k.D & S.sing	50 hours
1.Nerve and Muscle	S.k.D	8 hours
2.Digestion	Do	6 hours
3.Respiration	Do	6 hours
4.Cardiovascular System	Do	6 hours
5.Excretion	Do	6 hours
6.Reproduction and Endrocrine gland	Do	10 hours
7.Carbohydrate Metabolism	S.sing	4 hours
8.Lipid Metabolism	Do	4 hours
9.Protein Metabolism	Do	4 hours
10.Enzyme	Do	2 hours

Physiology and Biochemistry practical	S.K.D &S.sing	60 hours
1.Study of permanent histological section	S.K.D	15 hours
2.Study of mammalian duodenum,liver,lung, kidney	Do	15 hours
3.Qualitive test for carbohydrates	S.K.D & S.sing	30 hours

SEMESTER-III

Paper code- SEC-A(1)

Topic/Chapter Name	Name of the Teacher/Teachers	No of class(in hours)
Apiculture	S.K.D	30 hours
1.Biology of Bees	Do	2 hours
2.Rearing of Bees	Do	14 hours

3.Disease and Enemies	Do	6 hours
4.Bee Economy	Do	2 hours
5.Entreprenourship inApiculture	Do	6 hours

SEMESTER-IV

Paper code- CC4

Topic/Chapter Name	Name of the Teacher/Teachers	No of class(in hours)
Genetics and Evolutionary Biology	S.K.D & S.sing	50 hours
1.Mendelian Genetics and it's Extension	S.K.D	10 hours
2.Linkage , crossing over	DO	8 hours
3.Mutation	DO	8 hours
4.Sex determination	DO	8 hours
5.Origin of life	DO	2 hours
6.Evolutionary Theories	S.sing	6 hours
7.Process of Evolutionary Change	Do	4 hours
8.Speciation	Do	4 hours
Topic/Chapter Name	Name of the Teacher/Teachers	No of class(in hours)
Genetics and Evolutionary Biology Lab	S.K.D &S.sing	60 hours
1.Verification of Mendelian Ratio using Chi square test	S.k.D	15 hours
2.Identification of Human Aneuploidy using photo graph of karyotype	Do	10 hours
3.Phylogeny of horse with diagram of limb and skull	Do	10 hours
4.Study and identification of Drawin Finches from Photographs	Do	10 hours
5.Visit of natural history Museum	S.k.d & s.sing	15 hours

SEMESTER-IV

Paper Code- SEC-B (1)

Topic/Chapter Name	Name of the Teacher/Teachers	No. of classes
Aquarium fish keeping	S.sing	30 hours
1.Introduction to Aquarium	Do	2 hours
Fish keeping		
2.Biology of Aquarium fish	Do	10 hours
3.Food and feeding Aquarium fishes	Do	8 hours
4.Fish Transportation	S.k.d	5 hours
5.Maintenance of Aquarium	S.k.d	5 hours

SEMESTER-V

Paper code- DSE-A (1)

Topic/Chapter Name	Name of the Teacher/Teachers	No of class(in hours)
APPLIED ZOOLOGY	S.K.D & S.sing	50 hours
1.Host and Parasite Relationship	S.k.d	2 hours
2.Epidemiology of Disease	Do	5 hours
3.Parasitic protozoa	Do	7 hours
4.Parasitic Helminthes	Do	8 hours
5.Insect of Economic importance	Do	8 hours
6.Insect of Medical importance	S.sing	2 hours

7.Animal husbandary	Do	6 hours
8.Poultry Farming	Do	6 hours
9.Fish Technology	Do	6 hours
Topic/Chapter Name	Name of the Teacher/Teachers	No of class(in hours)
Applied zoology practical	S..K.D & S.sing	60 hours
1.Study the life stages through permanent slides	S.K.D	5 hours
2.Study of arthropods vectors associated with human disease	DO	10 hours
3.Study of insect damage to different plant part / stored grain through damaged product/photographs	DO	10 hours
4.Identifying features and economic importance	S sing	5 hours
5. Visit to poultry farm or animal breeding centre . Submission of visit report	S K.D & S.sing	15 hours
6.Maintence of freshwater aquarium	S.sing	15 hours

SEMESTER-VI

Paper code- DSE-B (2)

Topic/Chapter Name	Name of the Teacher/Teachers	No of classes
Ecology and wild life	S.K.D	60 hours
1.Introduction to Ecology	Do	4 hours
2.Population	Do	20 hours
3.Community	Do	11 hours

4.Ecosystem	Do	10 hours
5.Wid Life	Do	5 hours
Topic/Chapter Name	Name of the Teacher/Teachers	No of class(in hours)
Ecology and wild life Biology practical	S.K.D & S.sing	60 hours
1.Identification of flora , mammalian fauna,avian fauna	S.K.D	10 hours
2.Demonstration of basic equipment needed in wildlife studies use ,care,and maintenance (Compass, Binoculars, Spotting Scope,Range finder,Global Positioning system, various types of cameras and lenses)	DO	10 hours
3.Familarization and study animal evideces in the fiel , identification of animals through pug marks hoof mark scats ,pellet group,nest, antlers etc	DO	10 hours
study of an aquatic ecosystems, Phytoplankton and zooplankton , Measurements of area, temperature, Salinity, determination of pH and dissolved oxygen,chemiak oxygen demand and free Co2	S.K.D & S.sing	30 hours

CONCLUSION

It is a great honour to have the opportunity to thank the NAAC peer Team for giving us their valuable time to kindly and patiently listen to our departmental activities through the departmental profile.

We are also thankful for their visit to our department. In anticipation and soliciting necessary help for betterment of department as well as the college. The department of Zoology is thankful to our honorable TiC Dr. Debprasad Mandal and all colleagues for their support and whole hearted cooperation.