Department of Zoology
Rabindra Mahavidyalaya
Champadanga Hooghly

NOTICE

Date:18th-August-2023

It is here by informed to all the teachers and students that Syllabus distribution for Zoology Semester 4 classes will be as following.

Baisakhi Saha

Head of Department
Department of Zoology
Rabindra Mahavidyalaya
Champadanga Hooghly

Syllabus wise distribution for 3-Year Degree/4-Year Honours in Zoology under Curriculum and Credit Framework for Undergraduate Programmes (CCFUP) as per NEP, 2020 with effect from 2023-2024

Semester IV

Department of Zoology Mail Id: rabindramahavidyalayazoology@gmail.com

Major (4 Year & 3 Year)

Rabindra Mahavidyalaya Champadanga, Hooghly, West Bengal, India PIN-712401

Department Specific Course

Objectives of the Study:

To understand various functional components of an organism. To explore the complex network of these functional components. To comprehend the regulatory mechanisms for maintenance of function of the body.

Credits 5 (Theory:4, Practical: 1) Full Marks 75 (Theory: 40+Internal 15; Practical: 20) Number of Lectures: 60

Course Outcomes:

1. At the end of course the student should be able to understand:
2. Develop the skills to identify different types of blood cells.
3. Enhance basic laboratory skills like keen observation, analysis and discussion.
4. Learn the functional attributes of different organ systems of the body.

Paper Code and Subject	Unit		TOPICS (Credits: 5)	TOTAL NO. LECTURES (60)	Assign Teacher
ZOOL4041 [Major/DS Course (Core)] Animal Physiology	1	Digestion:	Structural organization and functions of Gastrointestinal tract and Associated glands; Importance of GI tract hormones. Digestion and absorption of Carbohydrates, Lipids, Proteins	10	Souren Dutta
	2	Respiration:	Mechanism of Respiration; Respiratory volumes and capacities; Transport of Oxygen and Carbon-di oxide in blood; Dissociation curves and the factors influencing it; Respiratory pigments; Carbon monoxide poisoning.	8	Souren Dutta
	3	Circulation:	Structure of mammalian heart; Cardiac Cycle and cardiac output. Components of Blood; Structure and functions of hemoglobin; Homeostasis; Blood clotting system; Hemopoiesis and its regulation..	8	Souren Dutta
	4	Thermoregulation and Osmoregulation	Physiological classification based on thermal biology; Osmoregulation in aquatic vertebrates; External osmoregulatory organs in vertebrates.	5	Dr. Eureka Mondal
	5	Renal system	Structure of nephron; Juxta-glomerular apparatus, Mechanism of counter current exchange and urine formation. Regulation of acid-base balance	5	Dr. Eureka Mondal
	6	Nervous System	Structure of neuron; Resting membrane potential; Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers; Types of synapses,Synaptic transmission and Neuro-muscular junction; Reflexaction and its types.	6	Dr. Eureka Mondal

Paper Code and Subject	Unit		TOPICS (Credits: 5)	TOTAL NO. LECTURES (60)	Assign Teacher
	7	Muscular System:	Different types of muscle; Ultrastructure of skeletal muscle; Molecular and chemical basis of muscle contraction. Origin and conduction of cardiac impulses.	6	Dr. Eureka Mondal
	8	Reproductive System	Basic structure of testis and ovary. Hormones of testis and ovary; Physiology of Reproduction (Estrus and Menstrual cycle).	5	Dr. Eureka Mondal
	9	Sensory system:	Eye: Physiological anatomy, Photo receptors, Visual pathway, visual reflexes, Defects of image formation. Ear: Physiological anatomy, Auditory pathway, Mechanism of hearing.	7	Dr. Eureka Mondal

Internal

Paper	Syllabus (Unit Wise)	Assigned Teacher	✆ & ✉	Marks Weightage
ZOOL4041 [Major/DS Course (Core)] Animal Physiology	Digestion: Respiration: Circulation:	Souren Dutta	9475671886/7031282464 srndutta@gmail.com	2
	Thermoregulation and Osmoregulation, Renal system, Nervous System, Muscular System, Reproductive System, Sensory system	Dr. Eureka Mondal	8250656417, 9476440223 mondal.eureka87@gmail.com/ eurekaugb@gmail.com/	3
	Total			5

Paper Codeand Subject	Unit	Topics (Credits:5)	Total No. Lectures (10)	AssignTeacher
ZOOL4041 [Major/DS Course (Core)] Animal Physiology	1	Estimation of Hemoglobin in human blood using Sahli's hemoglobinmeter	1	Dr. Eureka Mondal
	2	Differential staining of human blood corpuscles using Leishman stain	1	Dr. Eureka Mondal
	3	Determination of Bleeding Time & Clotting Time using suitable method.	1	Dr. Eureka Mondal
	4	Determination of Blood Group	2	Dr. Eureka Mondal
	5	Determination of Erythrocyte Sedimentation rate.	3	Dr. Eureka Mondal
	6	. Experiment of knee jerk by suitable method.	1	Souren Dutta

Internal

Paper	Syllabus (Unit number Wise)	Assigned Teacher	✆ & ✉	Marks Weightage
ZOOL4041 [Major/DS Course (Core)] Animal Physiology	6	Souren Dutta	9475671886/7031282464 srndutta@gmail.com	3
	1,2,3,4,5	Dr. Eureka Mondal	8250656417, 9476440223 mondal.eureka87@gmail.com/ eurekaugb@gmail.com/	2
	Total			5

OBJECTIVES OF THE STUDY

The specific learning goals for disease biology are to explore the causes of diseases of the animal world and to provide students with a working knowledge of fundamental concepts and molecular mechanisms leading to diseases. This will help in further understanding of the immune responses facilitating recovery and protection, also examine the mechanism of action of disease therapies and investigate the physiological and ecological factors that influence the frequency of disease occurrence.

Credits 5 (Theory:4, Practical: 1) Full Marks 75 (Theory: 40+Internal 15; Practical: 20) Number of Lectures: 60

COURSE OUTCOMES:

- ❖ Demonstrate a knowledge of innate and adaptive immunity, including the process of inflammation;
- ❖ Demonstrate a knowledge of how microbial pathogens (viruses, bacteria, and parasites) evade host defences and cause disease;
- ❖ Demonstrate a knowledge of how deregulation of cellular growth and differentiation cause disease;
- ❖ Demonstrate a knowledge of the pathobiology of the circulation, including the process of thrombosis and infarction.
- ❖ Demonstrate a knowledge of interactions between infectious organisms and their hosts, with particular reference to emerging infections;
- ❖ Recognize and identify a number of common bacterial species that may be associated with human and animal diseases.

Paper Code and Subject	Unit	TOPICS (Credits: 5)		TOTAL NO. LECTURES (60)	Asign Teacher
ZOOL4042 [Major/DS Course (Core)] Disease Biology	1	Basic concepts of disease	Endemic, epidemic, pandemic; acute and chronic, communicable, and non-communicable; infectious and contagious; zoonotic, water borne and nosocomial diseases	3	Dr. Payel Bhattacharjee
	2	Communicable Diseases	Mode of transmission, pathogenesis, and management of **Bacterial;** Cholera, Tuberculosis. **Viral;** (RNA (AIDS, SARS), DNA (Pox) & **Naked** (rhinovirus). **Protozoan;** Malaria, Amoebiasis, **Helminth:** Lymphatic Filariasis, Taeniasis	20	Dr. Baisakhi Saha
	3	Non-Communicable Diseases	Risk Factors, Pathophysiology & management of: **Gastro-intestinal diseases:** Diarrhea, Irritable Bowel Syndrome, Cirrhosis of liver. **Cardio-vascular diseases:** Atherosclerosis, Ischemic heart, and Myocardial infarction. **Diabetes:** Types 1 & 2, Gestational diabetes. **Kidney diseases** like Glomerular Nephritis, Nephrolithiasis. **Respiratory;** COPD	18	Dr. Payel Bhattacharjee
	4	Asthma and Allergy	Basic concept and types. Mechanism of allergic reaction, Diagnostic 4 test, and prophylactic measure	4	Dr. Baisakhi Saha
	5	Epidemiology	Epidemiology, Prevalence, Clinical Features and Preventive Strategies of: Protein Energy metabolism (PEM), Vitamin A Deficiency (VAD), Iron Deficiency Disorders (IDD).	15	Dr. Payel Bhattacharjee

Internal

Paper	Syllabus (Unit Wise)	Assigned Teacher	✆ & ✉
ZOOL4042 [Major/DS Course (Core)] Disease Biology	1, 2, 3	Dr Payel Bhattachrjee	9477159440/9051141362/payel.iicb@gmail.com/ drpayelb.rmz@gmail.com
	4, 5	Dr. Baisakhi Saha	9433315086, 9477549801 baisakhisaha008@gmail.com, baisakhisaha08@gmail.com
	Total internal marks 5		

Paper Code and Subject	Unit	Topics(Credits:3)	Total No. Lectures (10)	Assigned Teacher
ZOOL4042 [Major/DS Course (Core)] Disease Biology	1	**Identification of *Ascaris* sp. Male and Female, *Taenia* sp., *Entamoeba histolytica*, *Plasmodium vivax***	1	Dr. Baisakhi Saha
	2	**Quantitative estimation of glucose by GOD-POD**	1	Dr. Payel Bhattacharjee
	3.	**Demonstration of estimation of total Ig-E (EIA method)**	2	Dr. Payel Bhattacharjee
	4.	**TC and DC of blood**	1	Dr. Payel Bhattacharjee
	5	**A survey report of Diabetes mellitus distribution among different age groups and income groups**	1	Dr. Payel Bhattacharjee
	6	**Identification of patients with reasons (photographs): Rickets, Marasmus, Kwashiorkor.**	2	Dr. Baisakhi Saha
	7	**Identification of Salmonella antigen in serum (Using Widal Test teaching kit)**	2	Dr. Baisakhi Saha

Internal

Paper	Syllabus (Unit Wise)	Assign Teacher	✆& ✉
ZOOL4042 [Major/DS Course (Core)] Disease Biology	2,3,4,5	Dr Payel Bhattachrjee	9477159440/9051141362/payel.iicb@gmail.com/ drpayelb.rmz@gmail.com
	1,6,7	Dr. Baisakhi Saha	9433315086, 9477549801 baisakhisaha008@gmail.com, baisakhisaha08@gmail.com
	Total internal marks 5		

Objectives of the Course

To introduce basic terms of Endocrinology. To develop conceptual clarity of Endocrinology. To familiarize the learners with the structure, types, and classification of chromosomes. To introduce the concept of sex determination and its types, sex-linked, sex-influenced, and sex-Limited Genes. To develop an understanding of genetic variability within a population and learn as to how the changes take place.

Credits 5 (Theory: 4, Practical: 1)
Full Marks 50 (Theory: 40+Internal cum Practical: 10) TOTAL NO. LECTURES 60

Course Outcomes:

- Students understand how the endocrine system is functioning.
- They know the structures and molecular modes of action of a large variety of vertebrate and in vertebrate hormones and understand how metazoan hormones and their functional mechanisms have evolved.
- Hormones as mediators of growth, development, phenotype, behavior, reproduction, and epigenetic effects are covered and connected to relevant current events.

Paper Code and Subject	Unit		TOPICS (Credits: 5)	TOTAL NO. LECTURES (60)	Assign Teacher
ZOOL4043 [Major/DS Course (Core)] Comparative Endocrinology	1	Introduction to Endocrinology	Endocrine system, Classification of Hormones. Modes of hormone secretion and transport, feedback mechanism.	7	Palas Kanti Manna
	2	Invertebrate Endocrine System and Physiology	Insect hormones: types and their release sites, Endocrine regulation of insect growth and metamorphosis, moulting, diapauses Vertebrate-type hormones in Crustaceans: X-organ, Y-organ and associated neurochemical organs	8	Piyali Pakhira
	3	Vertebrate Endocrine System	Hypothalamus-hypophysial Axis; Pituitary gland (cell types), hormones and their functions. Pineal gland, biosynthesis of melatonin and its functions Cellular characteristics, Secretion, and functions of hormones from (a) Thyroid, (b) Pancreas, (c) Adrenal, (d) Testis and (e) Ovary Metamorphosis in Amphibians; Neoteny and Progenesis/Pedogenesis. Role of hormones in homeostasis: Glucose and Calcium. Hormonal control of Osmoregulatory Functions. Endocrinology of Mammalian reproduction: Regulation of spermatogenesis; Oogenesis; Endocrine control of gestation, parturition, and lactation.	25	Piyali Pakhira
	4	Molecular mechanism of hormone actions at cellular level:	Endocrine receptors, mechanism of actions of steroid and peptide hormones (emphasizing the role of second messengers)	10	Piyali Pakhira

Paper Code and Subject	Unit	TOPICS (Credits: 5)	TOTAL NO. LECTURES (60)	Assign Teacher
Special topics in Endocrinology	5	Endocrine disorders in Human, Endocrine disrupting chemicals (EDCs) Hormone mimics and their applied values with special reference to Insect pest management. Bioassays of hormones using RIA & ELISA.	4	Dr. Baisakhi Saha

Internal

Paper	Syllabus (Unit Wise)	Assigned Teacher	✆ & ✉
ZOOL4043 [Major/DS Course (Core)] Comparative Endocrinology	1,	Palas Kanti Manna	9732381772, 9382113782 palasmanna84@gmail.com
	2,3,4	Piyali Pakhira	8250576414, 7718534071 tukupakhira@gmail.com
	5	Dr. Baisakhi Saha	9433315086, 9477549801 baisakhisaha008@gmail.com, baisakhisaha08@gmail.com
	Total internal marks 5		

Paper Code and Subject	Unit	Topics(Credits:3)	Total No. Lectures (15)	Assigned Teacher
ZOOL4043 [Major/DS Course (Core)] Comparative Endocrinology	1	Dissect and display of Endocrine glands in laboratory bred Rat	1	Piyali Pakhira
	2	Study of permanent slides of all the endocrine glands (Thyroid, Adrenal, Pancreas, Testis, and Ovary).	1	Piyali Pakhira
	3.	Study of vaginal smear of rats for identification of different stages of estrous cycle	2	Piyali Pakhira
	4.	Demonstration of hormone assay through ELISA from available teaching kit	1	Dr. Baisakhi Saha

Internal

Paper	Syllabus (Unit Wise)	Assign Teacher	✆ & ✉
ZOOL4043 [Major/DS Course (Core)] Comparative Endocrinology	1,2,3	Piyali Pakhira	8250576414, 7718534071 tukupakhira@gmail.com
	4	Dr. Baisakhi Saha	9433315086, 9477549801 baisakhisaha008@gmail.com, baisakhisaha08@gmail.com
	Total internal marks 5		

Minor

Objectives of the Course

To provide a knowhow of the
(a) various aspects of wildlife, including their values, depletion, conflicts with human beings and principles of conservation and various ecological attributes,
(b) Management and legal protection of different natural habitats and threatened species, and
(c) different tools and techniques related to wildlife study.

Credits 5 (Theory: 4, Practical: 1)
Full Marks 50 (Theory: 40+Internal cum Practical: 10) TOTAL NO. LECTURES 60

Course Outcomes:

At the end of the course, students should learn about the importance of wildlife and conservation in and around our surroundings as well as wild habitats and their relation to different ecological principles, emerging cases of man – animal conflict and impact of ecotourism on wild animals, with a general knowledge on the different legal structures associated with wildlife fauna.

Paper Code and Subject	Unit	TOPICS (Credits: 5)	TOTAL NO. LECTURES (60)	Assign Teacher

Paper Code and Subject	Unit		TOPICS (Credits: 5)	TOTAL NO. LECTURES (60)	Assign Teacher
ZOOL4051 [Minor Course] Wildlife Conservation	1	Introduction to wildlife Conservation:	Definition and importance of wildlife; Threatened wildlife and IUCN status– Concept of Extinct, Critically Endange red, Endangered, Vulnerable and near threatened species with examples; Red data book Concept of conservation: in-situ (National parks, Sanctuaries, Community reserve, Conservation Reserves) & ex-situ methods of conservation. Biosphere Reserves: Concept of MAB, characteristics, examples from India.	15	Palas Kanti Manna
	2	Basic Concepts in Wildlife Ecology	**Basic Concepts in Wildlife Ecology, Basic Concepts in Wildlife**: Ecology Energy flows through ecosystems: linear and Y-shaped food chains, food web sand ecological pyramids. **Population attributes**: density, natality rate, mortality rate, sex ratio and age; survivorship curves. **Population growth**: exponential and logistic growth **Community characteristics**: species diversity (richness and abundance), keystone species, ecotone, and edge effect; concept of niche	20	Souren Dutta
	3	Species-specific Conservation	Conservation status, habit & habitat, threats, and conservation management of the following animals in India: Tiger /Olive ridley turtles/Great Indian bustard/Himalayan muskdeer/Greater one-horned rhinoceros /Ganges River dolphin	10	Palas Kanti Manna
	4	Man and Wildlife	Causes, consequences of human-wildlife conflicts and mitigation of conflict with special reference to project elephant in India	5	Palas Kanti Manna
	5	Management Planning of Protected Areas	Design and management of nature reserve; concept of wild life corridor; joint forest management. Ecotourism / Wildlife Tourism in forests: Positive and Negative impacts Wildlife (Protection) Act, 1972 [with amendments], problems in wild life protection, role of WWF, WCU, CITES, TRAFFIC	10	Palas Kanti Manna

Internal

Paper	Syllabus (Unit Wise)	Assigned Teacher	✆ & ✉
ZOOL4051 [Minor Course] Wildlife Conservation	1, 3, 4, 5	Palas Kanti Manna	9732381772, 9382113782 palasmanna84@gmail.com
	2	Souren Dutta	9475671886/7031282464 srndutta@gmail.com
	Total internal marks 5		

Paper Code and Subject	Unit	Topics(Credits:3)	Total No. Lectures (15)	Assigned Teacher
ZOOL4051 [Minor Course] Wildlife Conservation	1	Calculation of density and diversity indices (using Shannon-Weiner index) from natural/hypothetical community by quadrat method	5	Souren Dutta
	2	Study of animal evidence (paw marks and hoof marks, horns and antlers, scats and pellets, nests, etc. by photographs) and equipment in the field (GPS, binocular, camera trap, compass, radio tracker).	1	Souren Dutta
	3.	Pug mark analysis and census method	2	Palas Kanti Manna
	4.	Visit to any habitat of wildlife importance (Protected Areas, Biosphere Reserves, Wetlands and Ramsar Sites, Zoological and Botanical Gardens) and submission of field report.	1	Palas Kanti Manna

Internal

Paper	Syllabus (Unit Wise)	Assign Teacher	✆ & ✉
ZOOL4051 [Minor Course] Wildlife Conservation	1,2,	Palas Kanti Manna	9732381772, 9382113782 palasmanna84@gmail.com
	3,4	Souren Dutta	9475671886/7031282464 srndutta@gmail.com
	Total internal marks 5		