

GOVERNMENT COLLEGE BAHADURGARH

Lesson plan for the session 2023-24 (ODD SEMESTERS)

Course: B.Sc. (Medical) SUBJECT: ZOOLOGY

Semester I

Faculty: 1. Dr. Monika, Assistant Professor of Zoology

2. Dr. Shashi Raparia, Assistant Professor of Zoology

	Paper 1.1	Paper 1.2
July	Phylum- Protozoa: General characters Classification up to order level+ Biodiversity Economic importance + Type study of Plasmodium+Assignment 1. Parasitic protozoans: L.C., MOI and pathogenicity of <i>Entamoeba</i> , <i>Trypanosoma</i> , <i>Leishmania</i> , <i>Giardia</i> ; Student's seminars	1 Ultra structure of different cell organelles of animal cell. Plasma Membrane: Fluid mosaic model Various modes of transport across the membrane, mechanism of active transport.
August	Phylum- Porifera: General characters and classification up to order level Biodiversity and economic importance+ Test Type study - <i>Sycon</i> . Canal system in sponges and Spicules + Assignment	Passive transport, endocytosis and exocytosis. Endoplasmic reticulum (ER): types, role of ER in protein synthesis and transportation in animal cell Goigi complex: Structure, Associated enzymes and role of golgi-complex in animal cell + Assignment Ribosomes: Types, biogenesis, role in protein synthesis.
September	Phylum - Coelentrata: General characters, Classification up to order level Biodiversity+ Economic importance Type Study – <i>Obelia</i> + Corals and coral reefs Polymorphism in Siphonophores	Lysosomes: Structure, enzyme and their role; polymorphism Mitochondria: Mitochondrial DNA; as semiautonomous body, biogenesis, mitochondrial enzymes , role of mitochondria+ Test Cytoskeleton: Microtubules, microfilaments, Cilia and Flagella Ultrastructure & functions of Nucleus: Nuclear memb., nuclear lamina, nucleolus, fine st. of chromosomes, nucleosome concept & role of histones.
October	Phylum - Helminths: General characters, classification up to order level Biodiversity, economic importance Type study - <i>Fasciola hepatica</i>	Euchromatin and heterochromatin, lampbrush chromosomes and polytene chromosomes+ Assingment Introduction to cell cycle and Mitosis. Meiosis (Cell reproduction) + student seminars
November	Helminths parasites: L.H.,MOI and pathogenesisity of <i>Schistosoma</i> , <i>Ancylostoma</i> , <i>Trichinella</i> <i>Wuchereria</i> , <i>Oxyuris</i> + students' seminars Revision based on previous years question papers	Brief account of causes of cancer. An elementary idea of cellular basis of Immunity. Revision based on previous years question papers

Semester III

Faculty: 1. Dr. Monika, Assistant Professor of Zoology
2. Dr. Shashi Raparia, Assistant Professor of Zoology

DATES	Paper 3.1	Paper 3.2
July	Chordates: Principles of classification. Origin and Evolutionary tree; Role of amnion in evolution. Salient features of chordates; Functional morphology; Assignment 1 Biodiversity, Economic importance and conservation measures.	Introduction, Classification of Carbohydrates Structure, function and general properties of carbohydrates. Introduction, Classification of lipids.
August	Protochordates: General characters, classification upto orders with e.g.s. economic importance, conservation measures, Systematic position, distribution, ecology, morphology and affinities ; Quiz Urochordata: <i>Herdmania</i> – type study; Cephalochordata; <i>Amphioxus</i> – type study	Structure, function & general properties of Lipids+ Assignment Introduction, Classification, Structure, function and general properties of proteins + Test Nomenclature, Classification and mechanisms of enzyme action. Transport through bio membranes (Active and Passive), buffers
September	Cyclostomes: General characters and classification of phyla upto orders Economic importance and conservation measures, Classification and Ecological significance; students' seminar Type study of <i>Petromyzon</i> .	Nutrition: Nutritional components; Carbohydrates, fats, lipids, Vitamins and Minerals. Types of nutrition & feeding, Digestion of dietary constituents, viz. lipids, proteins, carbohydrates & nucleic acids; symbiotic digestion. Absorption of nutrients & assimilation; control of enzyme secretion Types of muscles, ultra-structure of skeletal muscle.
October	Pisces: General characters and classification upto orders economic importance and conservation measures Scales & Fins +Test	Bio-chemical and physical events during muscle contraction; single muscle twitch, tetanus. Muscle fatigue muscle, tone, oxygen debt., Cori's cycle, single unit smooth muscles, their physical and functional properties. Bones: Structure and types, classification, bone growth
November	Parental care in fishes, fish migration Types study of <i>Labeo</i> Revision based on previous years question papers	Effect of ageing on skeletal system Bone resorption and Bone disorders. Revision based on previous years question papers

Semester V

Faculty: 1. Dr. Monika, Assistant Professor of Zoology
2. Dr. Shashi Raparia, Assistant Professor of Zoology

DATES	Paper 5.1	Paper 5.2
July	Introduction to Curriculum, Details of Aquaculture Introduction to world fisheries Production: Production, utilization and demand	Basic concepts of ecology: Definition, significance. Concepts of habitat and ecological niche. Factors affecting environment: Abiotic factors (light-intensity, quality and duration) Temperature, humidity, Topography; edaphic factors; biotic factors.
August	Fresh Water fishes of India: River system, reservoir, pond Tank fisheries; captive and culture fisheries, cold water fisheries. Fishing crafts + Student Seminars Fishing gears+ Assignment Fin fishes, Crustaceans	Ecosystem: Concept, components, properties and functions; Students' seminars Ecological energetic, energy flow, food chain, food web Trophic structure; ecological pyramids, productivity concept.
September	Molluscs and their culture+ Quiz Seed production: Natural seed resources – its assessment, collection Hatchery production+ Test	Biogeochemical cycles: Concept +Test reservoir pool, gaseous cycles and sedimentary cycles. Population: Growth and regulation.
October	Nutrition: Sources of food (Natural, Artificial) . Feed composition (Calorie and Chemical ingredients). Field Culture: Ponds-running water. Recycled water, cage culture Poly culture.	Origin of life. Concept and evidences of organic evolution. Theories of organic evolution Concept of microevolution concept of species Concept of macro-and mega-evolution +Test
November	Culture technology: Biotechnology. Gene manipulation and cryopreservation of gametes Revision based on previous years question papers	Phylogeny of horse. Evolution of man. Revision based on previous years question papers

GOVERNMENT COLLEGE BAHADURGARH

Lesson plan for the session 2023-24 (EVEN SEMESTERS) Course: B.Sc. (Medical) SUBJECT: ZOOLOGY

Semester II

Faculty: 1. Dr. Monika, Assistant Professor of Zoology
2. Dr. Shashi Raparia, Assistant Professor of Zoology

	Paper 2.1	Paper 2.2
January	Phylum - Annelida: General characters and classification up to order level Biodiversity and economic importance of Annelida Type study - <i>Pheretima</i> (Earthworm)	Elements of Heredity and variations. The varieties of gene interactions Linkage and recombination: Coupling and repulsion hypothesis, crossing-over and chiasma formation; gene mapping.
February	Metamerism in Annelida + Assignment Trochophore larva. Affinities, evolutionary significance. Phylum – Arthropoda and Mollusca: General characters and classification, Biodiversity and economic importance of insects, Type study – <i>Periplaneta</i> Type study – <i>Pila</i> + Test	Sex determination and its mechanism, genetic balance system; role of Y-chromosome, male haploidy, cytoplasmic and environmental factors, Sex linked inheritance, Non-disjunction of sex-chromosome in <i>Drosophila</i> ; Sex-linked and sex influenced inheritance + Assignment Extra chromosomal and cytoplasmic inheritance. Multiple allelism, Human genetics: Human karyotype, Chromosomal abnormalities, twins.
March	Torsion and detorsion in gastropoda, Respiration and foot Type Study Phylum - Echinodermata: General characters and classification, Biodiversity and economic importance, Type Study - <i>Asteries</i> (Sea Star) Echinoderm larvae, Aristotle's Lantern	Inborn errors of metabolism + Quiz Nature and function of genetic material; Structure and type of nucleic acids; Protein synthesis spontaneous and induced mutations; gene mutations; chemical basis of mutations; transition, transversion, structural chromosomal aberrations, Numerical aberrations
April	Type study: <i>Balanoglossus</i> Student's seminar Revision based on previous years question papers	Applied genetics, DNA-finger printing, transgenic animals Student's seminar Revision based on previous years question papers

Semester IV

Faculty: 1. Dr. Monika, Assistant Professor of Zoology
2. Dr. Shashi Raparia, Assistant Professor of Zoology

	Paper 4.1	Paper 4.2
January	Amphibia: Origin, Evolutionary tree. Type study of frog (<i>Rana tigrina</i>), Parental Care in Amphibia	Circulation: Origin, conduction and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system; Composition and functions of blood & lymph; Mechanism of coagulation of blood, coagulation factors; anticoagulants, haemopoiesis
February	Reptilia: Type study of Lizard (<i>Hemidactylus</i>), Origin, Evolutionary tree. Extinct reptiles; Poisonous and non-poisonous snakes; Poison apparatus in snakes. Assignment	Respiration: Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of hemoglobin, Bohr's effect, Haburger's phenomenon (Chloride shift), control / regulation of respiration. Excretion: Patterns of excretory products viz. Amonotelic, ureotelic uricotelic, ornithine cycle (Kreb's– Henseleit cycle) for urea formation in liver.
March	Aves: Type study of Pigeon (<i>Columba livia</i>); Flight adaptation, Principles of aerodynamics in Bird flight, migration in birds + Test Adaptive radiations of mammals and dentition in mammals.	Excretion: Urine formation, counter-current mechanism of urine concentration, osmoregulation, micturition. Neural Integration: Nature, origin and propagation of nerve impulse along with medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse. Chemical integration of Endocrinology: Structure and mechanism of hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas and gonads.
April	Mammals: Classification, type study of Rat; Student's seminar Revision based on previous years question papers	Reproduction: Spermatogenesis, Capacitation of spermatozoa, ovulation, formation of corpus luteum, oestrous-anoestrous cycle, Menstrual cycle in human; fertilization, implantation and gestation. Student's seminar Revision based on previous years question papers

Semester VI

Faculty: 1. Dr. Monika, Assistant Professor of Zoology
2. Dr. Shashi Raparia, Assistant Professor of Zoology

	Paper 6.1	Paper 6.2
January	Study of important insect pests of: Sugarcane: Sugarcane leaf-hopper (<i>Pyrilla perpusilla</i>), Sugarcane Whitefly (<i>Aleurolobus barodensis</i>), Sugarcane top borer (<i>Sciropophaga nivella</i>), Sugarcane root borer (<i>Emmalocera depresella</i>), Gurdaspur borer (<i>Bissetia steniellus</i>) With their systematic position, habits and nature of damage caused. Life cycle and control of <i>Pyrilla perpusilla</i> only.	Historical perspectives, aims and scope of developmental biology. Generalized structure of mammalian ovum & sperm. Spermatogenesis and Oogenesis.
February	Cotton: Pink bollworm (<i>Pestiphora gossypifolia</i>), Red cotton bug (<i>Dysdercus Cingulatus</i>), Cotton grey weevil (<i>Myloccerus undecimpustulatus</i>), Cotton Jassid (<i>Amrasca devastans</i>) With their systematic position, habits and nature of damage caused. Life cycle and control of <i>Pectinophora gossypiella</i> . Wheat: Wheat stem borer (<i>Sesamia inferens</i>), Paddy: Gundhi bug (<i>Leptocorisa acuta</i>), Rice grasshopper (<i>Hieroglyphus banian</i>), Rice stem borer (<i>Scirpophaga incertullus</i>), Rice Hispa (<i>Diceladispera armigera</i>). Life cycle and control of <i>Loptocorisa acuta</i>	Fertilization, parthenogenesis, different types of eggs and patterns of cleavage in invertebrates and vertebrates, Process of blastulation in invertebrates and vertebrates, Fate-map construction in frog and chick. + Assignment
March	Vegetables and Stored grains: <i>Raphidopalpa faveicollis</i> – The Red pumpkin beetle. <i>Dacus cucurbitas</i> – The pumpkin fruit fly, <i>Tetranychus tecarius</i> – The vegetable mite, <i>Epilachna</i> – The Hadda beetle. Life cycle and control of <i>Aulacophora faveicollis</i> and <i>Trogoderma granarium</i> , Pulse beetle (<i>Callosobruchus maculatus</i>), Rice weevil (<i>Sitophilus oryzae</i>), Wheat weevil (<i>Trogoderma granarium</i>), Rust Red Flour beetles (<i>Tribolium castaneum</i>), Lesser grain borer (<i>Rhizopertha dominica</i>), Grain & Flour moth (<i>Sitotroga cerealella</i>) Test	Gastrulation in invertebrates and vertebrates, Gastrulation & formation of three germinal layers in frog and chick, Elementary knowledge of primary organizers. + Quiz
April	Biological control , Chemical control, IPM Important bird and rodent pests of agriculture & their management. Student's seminar Revision based on previous years question papers	Extra embryonic membranes: structure & significance in birds and mammals. Concepts of competence, determination and differentiation. Concept of regeneration. Student's seminar Revision based on previous years question papers