

Lesson Plan Session 2022 -2023

Name of Assistant/ Associate Professor: Dr. Rekha Saini

Class and Section: BSc. First year (4-5 days)

Subject ;ZOOLOGY

LESSON PLAN

September 2022

UNIT I

Phylum- Protozoa

- i) General characters and classification up to order level
- ii) Biodiversity and economic importance
- iii) Type study of Plasmodium
- iv) Parasitic protozoans: Life history, mode of infection and pathogenicity of Entamoeba, Trypanosoma, Leishmania and Giardia.

UNIT II

- Phylum- Porifera: i) General characters and classification up to order level
- ii) Biodiversity and economic importance
 - iii) Type study - Sycon.
 - iv) Canal system in sponges
 - v) Spicules in sponges

October 2022

UNIT-III

Phylum - Coelentrata:

- i) General characters and classification up to order level
- ii) Biodiversity, economic importance
- iii) Type Study – Obelia
- iv) Corals and coral reefs
- v) Polymorphism in Siphonophores

UNIT-IV

Phylum - Helminths:

- i) General characters and classification up to order level
- ii) Biodiversity, economic importance
- iii) Type study - Fasciola hepatica
- iv) Helminths parasites: Brief account of life history, mode of infection and pathogenesis of Schistosoma, Ancylostoma, Trichinella, Wuchereria and Oxyuris.

November 2022

UNIT-I

1. Ultrastructure of different cell organelles of animal cell.
2. Plasma Membrane: Fluid mosaic model, various modes of transport across the membrane, mechanism of active and passive transport, endocytosis and exocytosis.
3. Endoplasmic reticulum (ER): types, role of ER in protein synthesis and transportation in animal cell.
4. Goigi complex: Structure, Associated enzymes and role of golgi-complex in animal cell.

UNIT-II

- 1 Ribosomes: Types, biogenesis and role in protein synthesis.
- 2 Lysosomes: Structure, enzyme and their role; polymorphism
- 3 Mitochondria: Mitochondrial DNA; as semiautonomous body, biogenesis, mitochondrial enzymes (only names), role of mitochondria.
- 4 Cytoskeleton: Microtubules, microfilaments, centriole and basal body.
- 5 Cilia and Flagella

December 2022

UNIT-III

1. Ultrastructure and functions of Nucleus: Nuclear membrane, nuclear lamina, nucleolus, fine structure of chromosomes, nucleosome concept and role of histones,
2. Euchromatin and heterochromatin, lampbrush chromosomes and polytene chromosomes.

UNIT-IV

1. Mitosis and Meiosis (Cell reproduction)
2. Brief account of causes of cancer.
3. An elementary idea of cellular basis of Immunity.

Lesson Plan Session 2022 -2023

Name of Assistant/ Associate Professor: Dr. Rekha Saini
Class and Section: BSc. Final (1-6 days)
Subject ;ZOOLOGY

August 2022

Unit I

1. Introduction to world fisheries: Production, utilization and demand.
2. Fresh Water fishes of India: River system, reservoir, pond, tank fisheries; captive and culture fisheries, cold water fisheries.

September 2022

Unit II

- 3 Fishing crafts and gears.
4. Fin fishes, Crustaceans, Molluscs and their culture

Unit III

Seed production: Natural seed resources – its assessment, collection, Hatchery production. 2 Nutrition: Sources of food (Natural, Artificial) and feed composition (Calorie and chemical ingredients)

October 2022

Unit IV

- 3 Field Culture: Ponds-running water, recycled water, cage, culture; poly culture
4. Culture technology: Biotechnology, gene manipulation and cryopreservation of gametes

Unit I Paper II

1. Basic concepts of ecology: Definition, significance. Concepts of habitat and ecological niche
2. Factors affecting environment: Abiotic factors (light-intensity, quality and duration), temperature, humidity, topography; edaphic factors; biotic factors

November 2022

Unit II

1. Ecosystem: Concept, components, properties and functions; Ecological energetics and energy flow-food chain, food web, trophic structure; ecological pyramids concept of productivity
2. Biogeochemical cycles: Concept, reservoir pool, gaseous cycles and sedimentary cycles
3. Population: Growth and regulation

Unit III

Origin of life.

1. Concept and evidences of organic evolution
2. Theories of organic evolution
3. Concept of microevolution and concept of species

December 2022

UnitIV

1. Concept of macro-and mega-evolution.
2. Phylogeny of horse
3. Evolution of man.

Lesson Plan Session 2022 -2023

Name of Assistant/ Associate Professor: Dr. Rekha Saini

Class and Section: BSc. Second year(1-2 days)

Subject ;ZOOLOGY

LESSON PLAN

August 2022

UNIT I

Introduction, Classification, Structure, function and general properties of carbohydrates and lipids

September 2022

UNIT II

Introduction, Classification, Structure, function and general properties of proteins; Nomenclature, Classification and mechanisms of enzyme action. Transport through biomembranes (Active and Passive), buffers

UNIT III

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.

OCTOBER 2022

UNIT IV

Muscles: Types of muscles, ultra-structure of skeletal muscle. 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 and resorption, effect of ageing on skeletal system and bone disorders.

UNIT I PAPER I

Chordates: Principles of classification; Origin and Evolutionary tree; Role of amnion in evolution; Salient features of chordates; Functional morphology of the types with examples emphasizing their biodiversity, economic importance and conservation measures where required

NOVEMBER 2022

UNIT II

General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. Protochordates: Systematic position, distribution, ecology, morphology and affinities Urochordata: Herdmania – type study Cephalochordata; Amphioxus – type study

UNIT III

General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. Cyclostomes: Classification and ecological significance Type study of Petromyzon.

DECEMBER 2022

UNIT IV

General characters and classification of all phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. Pisces: Scales & Fins, Parental care in fishes, fish migration. Types study of Labeo Note: Type study includes detailed study of various system

Lesson Plan Session 2022 -2023

Name of Assistant/ Associate Professor: Dr. Rekha Saini

Class and Section: BSc. 1st(4-5 days)

Subject lesson plan: Zoology

FEBRUARY 2023

UNIT-I

Phylum - Annelida:

- i) General characters and classification up to order level
- ii) Biodiversity and economic importance of Annelida
- iii) Type study - Pheretima (Earthworm)
- iv) Metamerism in Annelida
- v) Trochophore larva: Affinities, evolutionary significance

UNIT-II

Phylum - Arthropoda:

- i) General characters and classification up to order level
- ii) Biodiversity and economic importance of insects
- iii) Type study – Periplaneta

MARCH 2023

UNIT-III

Phylum - Mollusca:

- i) General characters and classification up to order level
- ii) Biodiversity and economic importance
- iii) Type study - Pila
- iv) Torsion and detorsion in gastropoda
- iv) Respiration and foot

UNIT-IV

Phylum - Echinodermata:

- i) General characters and classification up to order level
- ii) Biodiversity and economic importance
- iii) Type Study -Asteries (Sea Star)
- v) Echinoderm larvae v) Aristotle's Lantern

APRIL 2023

UNIT-I

1. Elements of Heredity and variations.
2. The varieties of gene interactions
3. Linkage and recombination: Coupling and repulsion hypothesis, crossing-over and chiasma formation; gene mapping.

UNIT-II

1. Sex determination and its mechanism: male and female heterozygous systems, genetic balance system; role of Y -chromosome, male haploidy, cytoplasmic and environmental factors, role of hormones in sex determination.
2. Sex linked inheritance: Haemophilia and colour blindness in man, eye colour in Drosophila, Nondisjunction of sex-chromosome in Drosophila; Sex-linked and sex influenced inheritance.
3. Extra chromosomal and cytoplasmic inheritance:
 - i) Kappa particles in Paramecium.
 - ii) Shell coiling in snails.
 - iii) Milk factor in mice.

MAY 2023

UNIT-III

1. Multiple allelism: Eye colour in Drosophila; A, B, O blood group in man.
2. Human genetics: Human karyotype, Chromosomal abnormalities involving autosomes and sex chromosomes, monozygotic and dizygotic twins.
3. Inborn errors of metabolism (Alcaptonuria, Phenylketonuria, Albinism, sickle-cell anaemia).

UNIT-IV

1. Nature and function of genetic material; Structure and type of nucleic acids; Protein synthesis. spontaneous and induced (chemical and radiations) mutations; gene mutations; chemical basis of mutations; transition, transversion, structural chromosomal aberrations (deletion, duplication, inversion and translocation); Numerical aberrations (autopolyploidy, euploidy and polyploidy in animals)
2. Applied genetics: Eugenics, eugenics and euphenics; genetic counseling, pre-natal diagnostics, DNA-finger printing, transgenic animals

3. Concept of regeneration.

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FEBRUARY 2023

UNIT-I

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

UNIT-II

Respiration: Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of hemoglobin, Bohr's effect, Haldane's phenomenon (Chloride shift), control / regulation of respiration.

Excretion: Patterns of excretory products viz. Ammonotelic, ureotelic, uricotelic, ornithine cycle (Krebs-Henseleit cycle) for urea formation in liver.

MARCH 2023

UNIT-III

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.

UNIT-IV

Chemical Integration of Endocrinology: Structure and mechanism of hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas and gonads.

Reproduction: Spermatogenesis, Capacitation of spermatozoa, ovulation, formation of corpus luteum, oestrous-anoestrous cycle, Menstrual cycle in human; fertilization, implantation and gestation.

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.

APRIL 2023

UNIT-I

Amphibia: Origin, Evolutionary tree. Type study of frog (*Rana tigrina*), Parental Care in Amphibia

UNIT-II

Reptilia: Type study of Lizard (*Hemidactylus*), Origin, Evolutionary tree. Extinct reptiles; Poisonous and non-poisonous snakes; Poison apparatus in snakes.

MAY 2023

UNIT-III

Aves: Type study of Pigeon (*Columba livia*); Flight adaptation, Principles of aerodynamics in Bird flight, migration in birds.

UNIT-IV

Mammals: Classification, type study of Rat; Adaptive radiations of mammals and dentition.

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FEBRUARY 2023

Unit I

Study of important insect pests of crops and vegetables :

1 Sugarcane:

- (a) Sugarcane leaf-hopper (*Pyrilla perpusilla*)
- (b) Sugarcane Whitefly (*Aleurolobus barodensis*)
- (c) Sugarcane top borer (*Sciropophaga nivella*)
- (d) Sugarcane root borer (*Emmalocera depresella*)
- (e) Gurdaspur borer (*Bissetia steniellus*)

With their systematic position, habits and nature of damage caused. Life cycle and control of *Pyrilla perpusilla* only.

2 Cotton:

- (a) Pink bollworm (*Pectinophora gossypiella*)
- (b) Red cotton bug (*Dysdercus Cingulatus*)
- (c) Cotton grey weevil (*Mylocherus undecimpustulatus*)
- (d) Cotton Jassid (*Amrasca devastans*)

With their systematic position, habits and nature of damage caused. Life cycle and control of *Pectinophore gossypiella*.

MARCH 2023

Unit II

3 Wheat:

Wheat stem borer (*Sesamia inferens*) with its systematics position, habits, nature of damage caused. Life cycle and control.

4 Paddy:

- (a) Gundhi bug (*Leptocoris acuta*)
- (b) Rice grasshopper (*Hieroglyphus banian*)
- (c) Rice stem borer (*Scirpophaga incertullus*)
- (d) Rice Hispa (*Diceladispera armigera*)

With their systematic position, habits and nature of damage caused. Life cycle and control of *Loptocoris acuta*.

Unit III

5 Vegetables

- (a) *Raphidopalpa faveicollis* – The Red pumpkin beetle.
- (b) *Dacus cucurbitas* – The pumpkin fruit fly.
- (c) *Tetranychus tecarius* – The vegetable mite.

(d) *Epilachna* – The Hadda beetle.

Their systematic position, habits and nature of damage caused. Life cycle and control of *Aulacophora faveicollis*.

6 Stored grains:

- (a) Pulse beetle (*Callosobruchus maculatus*)
- (b) Rice weevil (*Sitophilus oryzae*)
- (c) Wheat weevil (*Trogoderma granarium*)
- (d) Rust Red Flour beetles (*Tribolium castaneum*)
- (e) Lesser grain borer (*Rhizopertha dominica*)
- (f) Grain & Flour moth (*Sitotroga cerealella*)

Their systematic position, habits and nature of damage caused. Life cycle and control of *Trogoderma granarium*

Unit IV

- 6. **Insect control:** Biological control, its history, requirement and precautions and feasibility of biological agents for control.
- 7. **Chemical control:** History, Categories of pesticides. Important pesticides from each category to pests against which they can be used. Insect repellants and attractants.
- 8. Integrated pest management.
- 9. Important bird and rodent pests of agriculture & their management.

APRIL 2023

Unit I

- 1. Historical perspectives, aims and scope of developmental biology.
- 2. Generalized structure of mammalian ovum & sperm. Spermatogenesis and Oogenesis.

Unit II

- 1. Fertilization, parthenogenesis, different types of eggs and patterns of cleavage in invertebrates and vertebrates.
- 2. Process of blastulation in invertebrates and vertebrates.
- 3. Fate-map construction in frog and chick.

MAY 2023

Unit III

- 1. Gastrulation in invertebrates and vertebrates
- 2. Gastrulation & formation of three germinal layers in frog and chick.
- 2. Elementary knowledge of primary organizers.

Unit IV

- 1. Extra embryonic membranes: structure & significance in birds and mammals.
- 2. Concepts of competence, determination and differentiation.