

SYLLABUS FOR LECTURER 10+2 ZOOLOGY

I. CYTOGENETICS AND MOLECULAR BIOLOGY/CELL AND MOLECULAR BIOLOGY / CELL BIOLOGY AND CYTOGENETICS

- (A) Structure and Functions of Cell and Cell differentiation:
1. Plasma membrane and cell permeability.
 2. Nucleus: morphological organization, nucleolus.
 3. Biochemical composition, structure and types of chromosomes.
 4. Molecular Biology of Genes.
 5. The Genetic code and protein biosynthesis.
- (B) Human Cytogenetics/Principles of Human Genetics
1. Biology of cells; effect of radiation on cancer cells and carcinogens.
 2. Biochemical Mutations; chromosomal anomalies and human disorders.
 3. Sex determination; history, chromosomal theory.
 4. Sex linked inheritance; sex linked inheritance in Drosophila and man colour blindness, y-chromosome inheritance.

II. ANIMAL BEHAVIOUR/AN INTRODUCTORY COURSE ON ETHOLOGY.

1. Migration, orientation types and Navigation.
2. Parental Behaviour- Reproductive Behaviour/Sexual selection.
3. Methods of communication.
4. Social organisation / Aggression and its type.
(a) Territoriality, (b) Hierarchy (c) Completion.
5. Learning behaviour and types of learning.
 - (i) Habituation
 - (ii) Classical conditioning
 - iii) Instrumental conditioning
 - iv) Imprinting

III. SYSTEMATICS AND EVOLUTION

1. Taxonomic collections, characters and methods of identification.
2. Theories of biological classification.
3. Sympatric: allopatric and Parapatric species.
4. Species concept and type concept.
5. Interspecific categories., Variations and their importance.
6. Isolation and speciation
7. Evolution of man.

IV. ENVIRONMENTAL BIOLOGY / ECOLOGY AND ENVIRONMENT BIOLOGY

1. Ecosystem study:
 - a) Concept
 - b) Circulation of water in Ecosystem/hydrological cycles.
 - c) Cycling of matter in ecosystem- Nitrogen and Phosphorous cycles (Bio-geochemical cycles: C.P.N. cycles).
 - d) Primary and Secondary productivity.
 - e) Energy flow in different ecosystems.
 - f) Air pollution, land and soil pollution, their control measures.

Limnology

1. History, scope, water as a medium.
2. Light and its fate in water.
3. Temperature including thermal stratification/Fate of heat in water.
4. Dissolved gases in water-Oxygen
5. Inorganic carbon in water - pH alkalinity and free carbon dioxide.
6. Nutrients
7. Plankton

8. Eutrophication.
9. Aquatic Pollution
 - i) Sources and kinds
 - ii) Effect of pollution on physico-chemical characteristics of water.
 - iii) Effects of pollution on biota.

V. WILDLIFE ECOLOGY AND MANAGEMENT/WILDLIFE BIOLOGY, CONSERVATION AND MANAGEMENT.

1. Ecological zones of India/Distribution of wildlife in India.
2. Wildlife of J and K - Status/detailed account.
3. Methods/Techniques of studying wildlife.
4. Measures for wildlife protection, conservation and control.
5. Sanctuaries, National parks- and their characteristic wildlife.

VI. DEVELOPMENTAL BIOLOGY AND COMPARATIVE ANATOMY/ REPRODUCTIVE AND DEVELOPMENTAL BIOLOGY

1. Development and differentiation of spermatozoa and egg-spermatogenesis and oogenesis.
2. Mechanism of Fertilization; approach of spermatozoa to the egg and reaction of the egg- Recognition between male and female gamete, Acrosome reaction of sperm and cortical reaction of egg.
3. Vitellogenesis
4. Cleavage
 - i) Pattern of cleavage.
 - ii) Gastrulation.
 - iii) Embryological significance of three germ layers
 - iv) Fate maps.
5. Development and Organogenesis of chick
 - i) Early development- Brain, spinal cord and eye; Heart.
 - ii) Excretory organism.
6. Menstrual cycle.

VII. PHYSIOLOGY AND ENDOCRINOLOGY/ANIMAL PHYSIOLOGY

1. Nutrition
 - i) Animal food, composition, feeding types, intracellular and extra cellular digestion.
 - ii) Digestive enzymes and their functions.
 - iii) Absorption from Gastro intestinal tract (GIT) and assimilation.
2. Respiration and Excretion
 - i) Respiratory mechanism
 - ii) Excretory physiology
3. Blood vascular system and Nervous system
 - i) Vertebrate heart, and its working
 - ii) Electric activity/Electro-cardiogram
 - iii) Heart beat/rate, cardiac output
 - iv) Blood- Composition, volume, functions
 - v) Blood coagulation.
 - vi) Control of cardio-vascular functions.
 - vii) Physiology of muscle contraction
 - viii) Physiology of nerve impulse

VIII. ICHTHYOLOGY

- i) Introduction, History, classification
- ii) Geographical distribution
- iii) Hill stream fishes adaptations
- iv) Deep sea fishes
- v) Fish skeleton-Exoskeleton and Endoskeleton.
- vi) Origin of fins in fishes
- vii) Osmoregulation
- viii) Blood vascular system
- ix) Electric organs
- x) Bioluminescence
- xi) Fish poisons/Venom.