

FOURTH SEMESTER

ZOOL, 401: ANIMAL BEHAVIOUR

UNIT-I

1. Introduction: Ethology as a branch of biology and animal psychology.
2. Classification of behavioral patterns, analysis of behavior (ethogram)
3. Reflexes and complex behavior
4. Perception of the environment: mechanical, electrical, chemical, olfactory, auditory and visual

UNIT-II

5. Evolution and ultimate causation: Inheritance behavior and relationships
6. Motivation: Drive, timing and Interaction of drivers, physiological basis of motivation, hormones and motivation, aggregation
7. Communication: Chemical, visual, light and audio, evolution of language
8. Ecological aspects of behavior: Habitat selection, food selection, optimal foraging theory, anti-predator defenses, aggression

UNIT-III

9. Homing, Behaviour, dispersal, host-parasite relations
10. Biological rhythms: Circadian rhythms
11. Orientation and navigation, migration of fishes, turtles and birds.
12. Learning and memory: Conditioning, habituation, insight learning, association learning, reasoning

UNIT-IV

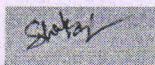
13. Reproductive behavior, Evolution of sex and reproductive strategies, mating systems, courtship, sexual selection, parental care
14. Social behavior, aggregation, schooling in fishes, flocking in birds, herding in mammals, group selection, kin selection, altruism, reciprocal altruism, inclusive fitness
15. Social organization in insects
16. Social Organization in primates.

UNIT-V

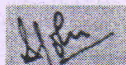
17. Neural and Hormonal control of behavior
18. Genetic and environmental components in the development of behaviour
19. Bioluminescence
20. Electric organs and behavior

Suggested Readings:

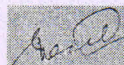
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McGraw Hill, New York
Alcock, J. I. Animal Behaviour An Evolutionary approach, Sinauer Assoc. Sunderland, Massachsets U.S.A
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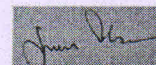
Dr. Sonia Johari



Dr. D.K. Sharma



Dr. Praveen Tamot



Dr. Sanjay Sharma

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Sonali
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Ain
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Nasreen
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Mishra
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Sanjay
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Sanjay
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ZOOL, 402: BIOLOGY OF PARASITISM AND VERTEBRATE IMMUNE SYSTEM

UNIT-I

1. Parasitism: Concept, origin, evolution, advantages and disadvantages in the parasitic life
2. Modes of parasitic invasion: Passive, mechanical, active, contact, transovarial pathways of entry and sites of habitation
3. Host specificity: Definition, origin, types, structural, physiological & pathological response, tissue, ecological and phylogenetic response
4. Host-parasite system: Effects of parasites on hosts (mechanical, nutritional, destructive, toxic etc.)

UNIT-II

5. Host reactions to parasites: Resistance, compatibility and immunity
6. Innate and acquired immunity
7. Cells of immune system and their differentiation
8. Nature of immune response: Antigenicity and immunogenicity, factors influencing immunogenicity, epitopes and haptens

UNIT-III

9. Structure and functions of antibodies: Classes and subclasses, gross and fine structure, antibody mediated effector functions
10. Antigen-antibody Interactions: Antibody affinity and avidity, gross reactivity, agglutination
11. Major histocompatibility complex in mouse and HLA system in human: MHC haplotypes, class-I and class-II molecules, cellular distribution, peptide binding, expression and diversity, disease susceptibility and MHC/HLA
12. T- cell receptors: Isolation, molecular components and structure, T-cell maturation and thymus, T-cell activation mechanism, T- cell differentiation, cell death and T-cell population

UNIT-IV

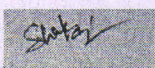
13. B-cell generation, activation and differentiation: B-cell receptors, selection of immature and self reactive B-cells, B-cell activation and proliferation, T-B- cell interactions, humoral immune response and kinetics
14. Cytokines: Structures and functions, cytokine receptor, cytokines and immune response
15. Complement system: Component activation & biological consequences
16. Cell-mediated effector functions: Cell adhesion molecules, effector cells and molecules, CTL and NK cells- mechanisms of action, delayed type hypersensitivity

UNIT-V

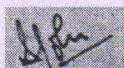
17. Immune response to infectious diseases: Immune response to viral, bacterial, protozoan and other parasitic worms
18. Vaccines: Types of vaccines, active and passive immunization
19. Immunodeficiency disorders: Primary immunodeficiencies, secondary or acquired immunodeficiencies (AIDS)
20. Transplantation: Immunological basis of graft rejection, general and specific Immunosuppressive therapy

Suggested Readings:

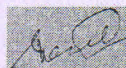
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Paul, W, Fundamentals of Immunology
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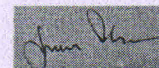
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COURSES FOR SPECIAL. (ELECTIVE) GROUPS:
A. AQUATIC BIOLOGY AND AQUACULTURE

ZOOL, 403 (A) FISHERIES AND PISCICULTURE

UNIT-I

1. Classification of commercially important fish fishes and shell fishes and their significance
2. Fishes and shell fishes of Madhya Pradesh
3. Reservoir and lake fisheries (with emphasis on Tighra reservoir)
4. Reverine fisheries
5. Estuarine and brackets water fisheries

UNIT-II

6. Marine fisheries of India
7. Environmental factors (a biotic and biotic) in relation to life of fishes
8. Exotic fishes larvicidal fishes and their signigicance
9. Common parasites of fishes, fish diseases, their control and treatment
10. Economical importance of fishes and their by-products

UNIT-III

11. Cultivable species of inland fishes and principle of their selection
12. Predatory fishes and their importance in fish culture
13. Plankton and their importance in fish culture
14. Fish ponds and their hydrobiological requirements
15. Principles of genetics, hybridization and sex determination in fish

UNIT-IV

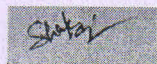
16. Transgenic, fish, formation and importance
17. Traditional verses modern fish culture practices
18. Paddy corn fish culture and its significance
19. Sewage fish culture and its importance
20. Fish net, gears and method of fishing

UNIT-V

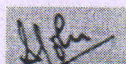
21. Fish preservation technology and packing
22. Marketing of fishes and role of co-operative societies
23. Fisheries and rural development
24. Fisheries legstation
25. Fisheries development in Madhya Pradesh

Suggested Readings:

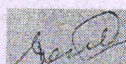
H.R. Singh & S.S. Khanna : Textbook of Fish Biology & Fisheries, Narendra Publishing House Delhi
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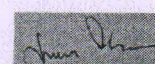
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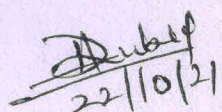
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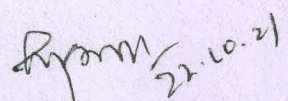


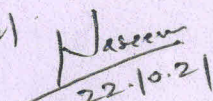
Dr. Praveen Tamot

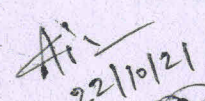


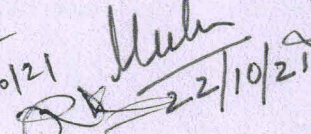
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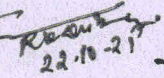

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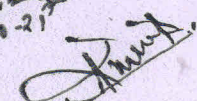

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ZOOL, 404 (A): AQUACULTURE

UNIT-I

1. Identification of stages of life histories of important cultivable fishes and prawn
2. Natural breeding, bundh breeding and Induced breeding of carps through hypophysation and drugs
3. Planning and designing of freshwater fish farms
4. Management of rearing, nursery and stocking ponds

UNIT-II

5. Transport of live fish and fish seed
6. Planning and management of brackish-water fish farms
7. Nutritional requirements of fish and artificial diet
8. Freshwater aquaculture, Prospectus and management
9. Methods of aquaculture: Pen culture, Cage culture, bottom and off bottom culture

UNIT-III

10. Integrated fish farming in India: Agriculture cum fishery, trapa-cum-fishery, poultry,cum-fishery, puffer cum fishery, poultry-piggery-fishes
11. Economical aspect of fish culture management
12. Freshwater prawn culture practice in India
13. Brackish water prawn culture development in India

UNIT-IV

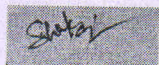
14. Prospects and development of mariculture: Pearl culture mussel culture and oyster culture
15. Frog culture: Species Breeding, Culture, and polyculture with fish
16. Culture of freshwater macrophytes (Azolla) and algae (Spirulina)
17. Prospectus and development of turtle fishery

UNIT-V

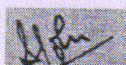
18. Breeding and rearing of crocodiles, crocodile industry: Indian and International,Perspective
19. Production of Jayanti culture of fresh water oyster for pearls, and sea weed culture
20. Whaling industry: Sustainable utilization
21. Major aquatic resources: Export and economic status in India

Suggested Readings:

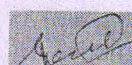
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hoar and Radndall Fish Physiology Vol-16. Academic Press
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Srivastva, C.B.I Fishery science and fisheries kitah Mahai.
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Hynes, H.B.N. The Ecology of hunning water Liverpool Uni Press
Chokrahorty, C. and Sadhu, A.K. Biology Hatchery and Culture Technology of Tiger prawn and gial freshwater Prawn Daya Pub. House,Delhi
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Wetzel, R.G. Limnology Lake and Resevoir ecosystem Academe Press



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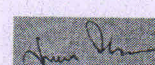
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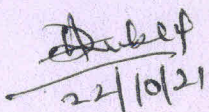
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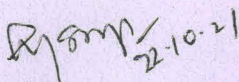


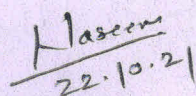
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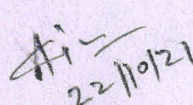


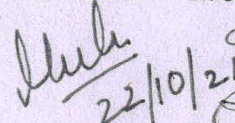
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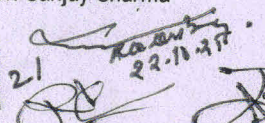

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