Maharaja Surajmal Brij University

Bharatpur (Rajasthan)

Syllabus

Multidisciplinary Course

Subject: Zoology

Semester – III,IV,V&VI

Session (2024-25)

अरुण कुमार पाण्डेय
उपकुलसचिव
प्रभारी अकादमिक प्रथम

Syllabus

MDC-ZOO 20T -1001 ETHOLOGY, EVOLUTION, ECOLOGY AND WILDLIFE

III/IV-Semester - [ZOOLOGY]

Semester	Code of the Course	Title of the Course/Paper			NHEQF Level	Credits
III/IV	MDC-ZOO-20T -1001	Ethology, Evolution, Ecology and Wildlife			6	4
Level of Course	Type of the Course	Credit Distribution			Offered to NC Student	Course Delivery Method
		Theory	Practical	Total		
6	MDC	4	0	4	Yes	Lectures: 60
List of Programme Codes in which Offered as Minor Discipline		Not Applicable				
Prerequisites		II/III Semester				
Objectives of the Course:		The learning objectives of this course are as follows: • Understand ecological interactions between organisms and their environment. • Gain knowledge of population, community, and ecosystem ecology. • Explore major ecosystems and biogeographical zones. • Learn about wildlife conservation, threats, and protection strategies. • Study animal behavior, social organization, and the process of evolution.				

MDC- ZOO 20T -1001-ETHOLOGY, EVOLUTION, ECOLOGY AND WILDLIFE

Unit-I

Introduction to Animal Behavior: History, Concepts, Sign Stimulus, Fixed Action Pattern (FAP), Action-Specific Energy (ASE), Innate Releasing Mechanism (IRM) **4 Hrs.**

Learning in Animals: Definition and Types of Learning; Pheromones **3 Hrs.**

Biological Clocks: Introduction, Types, and Significance of Biological Clocks **3 Hrs.**

Parental Behavior and Social Organization: Patterns and Types of Parental Care; Properties and Advantages of Social Grouping, Social Groups of Monkeys **3 Hrs.**

Communication and Aggression: Auditory, Tactile, Visual, and Chemical Communication; Types and Causes of Aggression **2 Hrs.**

Unit-II

Historical Perspectives on Evolution: Lamarckism and the Theory of Inheritance of Acquired Characters, Pre-Darwinian Concepts of Life, Darwin's Voyage on the HMS Beagle **3 Hrs.**

Natural Selection and Evolution: The Driving Force of Evolution, Concept of Species, Speciation, and Isolation **4 Hrs.**

Genetic Drift, Gene Flow, and Migration: Understanding Evolutionary Mechanisms **4 Hrs.**

Mutations: Sources of Genetic Variations and Their Role in Evolution **4 Hrs.**

Unit-III

Basic Concepts, Definitions, and Scope of Ecology: Organization Levels of Ecological Systems, Concept of Limiting Factors **3 Hrs.**

Population Characteristics and Community Organization: Structure and Organization of Communities, Species Interactions, Ecological Succession, and Climax Community **4 Hrs.**

Structure of Ecosystems: Biotic and Abiotic Components, Food Chains, Food Webs, Ecological Pyramids; Types of Ecosystems with Special Reference to India **4 Hrs.**

Biogeographical Zones of India: Types of Forest and Grasslands in India **4 Hrs.**

Unit-IV

Definition and Significance of Wildlife: Ecological Balance, Ecosystem Services, Economic, Cultural, and Recreational Values **4 Hrs.**

Threats to Wildlife:habitat destruction, degradation, fragmentation, overexploitation, poaching, pollution, climate change, illegal wild life trade **2 Hrs.**

Wildlife Conservation Strategies: Protected Areas and Reserves: National Parks, Wildlife Sanctuaries, and Biosphere Reserves; Captive Breeding, and Reintroduction Programs **5 Hrs.**

Emerging Technologies in Wildlife Conservation: Use of Drones, GPS, and Remote Sensing; Careers in Wildlife Studies **4 Hrs.**

Suggested Books and References

1. Ecology and Environment, P.D. Sharma, Rastogi Publications.
2. Fundamentals of Ecology, E. Odum, Cengage India Private Limited.
3. Animal Behaviour, R. Mathur, Publisher Not Provided, Rastogi Publications.
4. Evolutionary Biology: Concepts and Applications, Douglas J. Futuyma.
5. Evolutionary Analysis, Scott Freeman & Jon C. Herron.
6. Why Evolution is True, Jerry A. Coyne, Popular Science.

Course Learning Outcome:

- Study animal behavior, learning processes, biological clocks, communication, and social organization.
- Grasp the principles of evolution, natural selection, speciation, and the role of genetic variation in evolutionary processes
- Understand ecological concepts, community organization, and ecosystem structures.
- Explore biogeographical zones, forest and grassland types, and the significance of wildlife in maintaining ecological balance.
- Analyze threats to wildlife and conservation strategies, including emerging technologies and career opportunities.

Syllabus

MDC- ZOO20T -2001 APPLIED ZOOLOGY

V/VI-Semester - [ZOOLOGY]

Semester	Code of the Course	Title of the Course/Paper			NHEQF Level	Credits
V/VI	MDC-ZOO-20T -2001	Applied Zoology			7	4
Level of Course	Type of the Course	Credit Distribution			Offered to NC Student	Course Delivery Method
		Theory	Practical	Total		
7	MDC	4	0	4	Yes	Lectures: 60
List of Programme Codes in which Offered as Minor Discipline		Not Applicable				
Prerequisites		III/IV Semester				
Objectives of the Course:		The learning objectives of this course are as follows: • Understand the fundamentals of microbiology, including the classification and structure of microorganisms. • Explore the significance of microorganisms in health, environmental, and industrial contexts. • Learn about major bacterial, viral, protozoan, and helminth diseases affecting humans. • Study the principles of animal husbandry and its role in human welfare. • Gain knowledge of specialized agricultural practices like lac culture, apiculture, sericulture, pearl culture, and				

	vermiculture.

MDC- ZOO 20T -2001-APPLIED ZOOLOGY

Unit-I

Overview of Microbiology: Definition and history of microbiology, Structure, Characteristics and classification of microorganisms: Bacteria, Viruses, Fungi, Protozoa, and Algae; Normal human flora, Vaccination, Importance of microbiology in health, environment, and industry **5 Hrs.**

Protozoan and Helminth diseases: Entamoeba, Trypanosoma, Leishmania, Plasmodium, Wuchereria, and Dracunculus. **5 Hrs.**

Arthropods as Disease Vectors: Malaria, Dengue, Filariasis, Japanese Encephalitis, and Plague. **5 Hrs.**

Unit-II

Bacterial Diseases:Tuberculosis, Strep Throat, Pneumonia, Whooping Cough, Urinary Tract Infection (UTI), Gonorrhea, Syphilis, Cholera, Diphtheria, Tetanus, Anthrax, Leprosy, Meningitis. **8 Hrs.**

Viral Diseases: Influenza (Flu), Common Cold, COVID-19, HIV/AIDS, Hepatitis (A, B, C), Measles, Chickenpox, Human Papillomavirus (HPV) Infections, Dengue Fever, Polio, SARS (Severe Acute Respiratory Syndrome). **7 Hrs.**

Unit-III

Animal husbandry: Livestock production and management (dairy farming, poultry farming, fish farming, etc.), the role of animal husbandry in human welfare (dairy, meat, medicine, fibre, manure, etc.) **5 Hrs.**

Lac culture: Elementary idea of Plant host and Life cycle of lac insect, management of culture industry, by-products **5 Hrs.**

Apiculture: Bee species, social organization and the life cycle of honeybees, artificial bee hives, management of beekeeping, by-products **5 Hrs.**

Unit-IV

Sericulture: Introduction to sericulture, Species of silkworms, Life cycle of silkworms Silk production, Techniques in silk farming, Management of silkworms. **5 Hrs.**

Pearl Culture: Species of pearl oysters, Life cycle of pearl oysters, Pearl farming techniques and By-products of pearl culture **5 Hrs.**

Vermiculture: Life cycle of earthworms, Vermicomposting techniques, Setting up vermiculture bins, Maintenance, and management of vermiculture systems, Benefits and applications of vermiculture. **5 Hrs**

Suggested Books and References

1. Economic Zoology, Biostatistics and Animal behaviour S. Mathur, Rastogi Publications.
2. Economic Zoology, Shukla G.S. & Upadhyay V.B., Rastogi Publications.
3. Perspectives in Indian Apiculture. Mishra R C Allied scientific publ. Bikaner India 1999.
4. A Textbook of Applied Entomology, Srivastava, K. P., Publ. Kalyani Publishers, New Delhi. 1988.
5. Text Book of Applied Entomology Vol. I & II by K. P. Srivastava.
6. General Applied Entomology by B V David and T N Anathakrishnan.
7. Ahsan J and Sinha SP: A Hand book on Economic Zoology. 9' edition S. Chand & Co. Ltd., 1981.
8. Prescott's Microbiology by Joanne.M.Willey,Linda Sherwood,Christoppher J Woolverton,2017. McGraw-Hill Education, Meerut.
9. Microbiology -concepts and applications: Micheal Joseph Pelczar,Eddie Chin Sun Chan,Noel R. Krieg. McGraw-Hill Education, Meerut

Course Learning Outcome:

- Classify and describe the structure and characteristics of various microorganisms, including bacteria, viruses, fungi, protozoa, and algae.

- Identify and explain the causes, symptoms, and basic treatments of common bacterial and viral diseases.
- Recognize the importance of normal human flora and the role of vaccination in disease prevention.
- Demonstrate an understanding of livestock management and the production processes in dairy, poultry, fish farming, and other animal husbandry practices.
- Apply knowledge of specialized agricultural techniques in lac culture, apiculture, sericulture, pearl culture, and vermiculture for sustainable development.