

As per the NEP 2020
Minor Course (Science)
(Effective from Academic Year 2024-2025 onwards)



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Science
Minor Subject Syllabus
(CBCS) As per the NEP 2020 (Semester I to IV)
w.e.f. the Academic Session 2024-25
Discipline: Zoology

Semester	Course title	Credits	Course Code	Credit distribution of the course			Eligibility criteria
				Lecture	Tutorial	Practical/ Practice	
I	Structure and Function of Non-Chordate	2	24BZO5101M	2	0	0	10+2 from any recognized Board
II	Structure and function of Chordates	2	24BZO5201M	2	0	0	
III	Human Physiology	4	24BZO6301M	4	0	0	
IV	Economic Zoology	4	24BZO6401M	4	0	0	

Objectives:

The course Objectives to provide students with a basic understanding of:

- Basis of classification,
- Salient Feature and Life cycle of prominent example
- Different physiological body processes of invertebrates
- Larval forms of invertebrates

Learning outcomes- Students can understand:

1. The basis of classification of non-chordate, Learn the systematics and biology of nonchordates through their adaptive features.
2. Study the functional biology of nonchordates through their body organization.
3. Comprehend identification of species and their evolutionary relationships.

Course Title:	Structure & Function of Non-Chordate	Course Code: 24BZO5101M
Total Lecture hour 26		Hours
Unit I	Five Kingdom Concept of classification Classification of Animal Kingdom upto Classes with prominent examples (Basis of classification (brief account)-: Symmetry, Coelom, Segmentation, Embryogeny and level of organization)	8
Unit II	Salient feature and life cycle of Amoeba, Plasmodium, Sycon, Hydra/ Obelia, Economic importance of Protozoan and Coral reefs,	6
Unit III	Salient Feature and life cycle of Tapeworm, Ascaris, Earthworm, Economic importance of Helminthes, Apiculture, Sericulture. Disease caused by mosquito and House fly, Ticks and mites.	8
Unit IV	Salient feature and Life cycle of Pila, Pinctada (Pearl Culture,) Star fish, Basic Character of Hemichordate and its body Adaptation.	4
Reference Books:		
1	Invertebrates Zoology Authors, E.L. Jorden and P.S. Verma	

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2	Modern text book of Zoology invertebrates, Author R.L. Kotpal
3	Economic Zoology, Rastogi Publishers Authors, Shukla and Upadhyaya (2002).
4	Invertebrate structure and function. ; Barrington E.J.W. Thomas Nelson & Sons Ltd. London.

Outcome of the course: At the end of the course the student will be able to:

1. Understands silkworms rearing and their products.
2. Gain knowledge in Bee keeping equipment and apiary management.
3. Acquaint knowledge on dairy animal management, the breeds and diseases of cattle and learn the testing of egg and milk quality.
4. Acquaint knowledge about the culture techniques of fish and poultry.
5. Acquaint the knowledge about basic procedure and methodology of Vermiculture.
6. Learn various concepts of lac cultivation.
7. Students can start their own business i.e. self-employments.
8. Get employment in different applied sector

Course Title:	Structure and function of Chordates	Course Code: 24BZO5201M
Total Lecture hour 26		
Unit I	Origin and general characters of Chordata phylum. Classification and characters of Lower Chordates, general characters of Agnatha.	Hours 6
Unit II	Fishes: General characters and classification up to Class level. Types of scales and fins of fishes, migration and parental care in fishes. Amphibians: General characters, <i>Rana tigrina</i> as type study, parental care, neoteny and paedogenesis.	6
Unit III	Reptilia: General characters and Identification of poisonous and non-poisonous snakes, biting mechanism of snakes. Aves: General characters and Study of <i>Columba</i> (Pigeon), Flight adaptations & bird migration.	8
Unit IV	Mammalia: General characters and classification up to order level, Study of rabbit. Economic importance of mammals.	6
Reference Books:		
1	Evolution of Chordate Structure by H.S. Smith. Publisher: Hold Rinchart and Winstoin Inc. New York.	
2	Students Text Book of Zoology, Vol. II by AA Sedgwick. Publisher: Biblio Life.	
3	Comparative anatomy of vertebrates by CG Kent. Publisher: McGraw Hill, NY.	
4	Outlines of Comparative Autonomy of Vertebrates by JS Kingsley. Publisher: Central Book Depot. Allahabad.	

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Course Title:	Human Physiology	Course Code: 24BZO6301M
Total Lecture hour 52		
Unit I	Digestion and Respiration: Digestion: Mechanism of digestion & absorption of carbohydrates, Proteins, Lipids and nucleic acids, along control of digestive juices secretion. Respiration: Exchange of gasses, Transport of O ₂ and CO ₂ , Control mechanism of respiration.	Hours 12
Unit II	Circulation: Composition of blood, blood corpuscles: structure and function, Structure of heart: Cardiac output, cardiac cycle, Control mechanism of heartbeat. Lymphatic system.	12
Unit III	Neuro-endocrine: Mechanism of generation & propagation of nerve impulse, structure of synapse, synaptic conduction. Types of hormone, Structure and function of different endocrine glands: Hypothalamus-pituitary, thyroid, parathyroid, pancreas, gonads and adrenal. Hypo & Hyper-secretions.	14
Unit IV	Muscle Physiology: Structure of skeletal muscle: contractile and non-contractile components, mechanism of contraction. Osmoregulation and Homeostasis: Excretion: modes of excretion, structure of kidney, Mechanism of urine formation. Hypertonic and hypotonic urine excretion.	14
Course outcome:		
<ul style="list-style-type: none"> • Understand the process of digestion, absorption and respiration along with the control mechanism. • Understand the process of blood and lymph circulation along with the process of coagulation. • Understand the structure of heart and cardiac cycle along with its control mechanism. • Understand the process of Impulse generation and conduction as well as the role of endocrine system in physiology. • Understand the structure and function of muscles. • Understand the process of excretion and control of blood pressure to maintain homeostasis. 		
Reference Books:		
1	Tortora, G.J. and Derrickson, B.H. (2016). Principles of Anatomy and Physiology, 15 th edition, John Wiley & Sons, Inc.	
2	Guyton, A.C. and Hall, J.E. (2011). Textbook of Medical Physiology, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company. Philadelphia	
3	Linda, S.C. (2018) BRS Physiology, Wolters Kluwer, Philadelphia	
4	Shu-Xin Zhang (1999). An Atlas of Histology, Springer Science, New York.	

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Course Title:	Economic Zoology	Course Code: 24BZO6401M
Total Lecture hour 52		Hours
Unit I	Apiculture: Species of honey bees in India, life cycle of <i>Apis indica</i> • Colony organization, division of labour and communication • Bee keeping as an agro based industry; methods and equipment: indigenous methods, extraction appliances, extraction of honey from the comb and processing • Chemical Nature of Bee venom, honey and bees wax and their uses • Pests and diseases of bees and their management	12
Unit II	Sericulture: History and present status of sericulture in India • Species of Silk in India • Mulberry cultivation • Morphology and life cycle of <i>Bombyx mori</i> • Silkworm rearing techniques: Processing of cocoon, reeling, types of silk • Silkworm diseases-pests and their control.	12
Unit III	Vermiculture: Scope of Vermiculture. • Types of earthworms. • indigenous and exotic species of Earthworms. • Methodology of vermicomposting: containers for culturing, raw materials required, preparation of bed, environmental pre-requisites, feeding, harvesting and storage of Vermicompost. • Advantages of vermicomposting. Diseases and pests of earthworms.	12
Unit IV	Pearl culture: History and scope of pearl culture in India, Types of Species, Methods of pearl culture, harvesting of pearl culture. Pest of pearl culture. Product and importance of Pearl. Poultry Farming: Types of breeds and their rearing methods • Feed formulations for chicks • Nutritive value of egg and meat. • Disease of poultry and control measures.	16
Course outcome:		
<ul style="list-style-type: none"> • Understands silkworms rearing and their products. • Gain knowledge in Bee keeping equipment and apiary management. • Acquaint knowledge about the culture techniques of poultry. • Acquaint the knowledge about basic procedure and methodology of Vermiculture. • Learn various concepts of perl culture. • Students can start their own business i.e. self-employments. • Get employment in different applied sector 		
Reference Books:		
1	Eikichi, H. (1999). Silkworm Breeding (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.	
2	Roger, M (1990). The ABC and Xyz of Bee Culture: An Encyclopedia of Beekeeping, Kindle Edition.	
3	Shukla and Upadhyaya (2002). Economic Zoology, Rastogi Publishers Meerut.	
4	Yadav Manju (2003). Economic Zoology, Discovery Publishing House.	

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