## BHARATHIAR UNIVERSITY: COIMBATORE 641 046

ALLIED ZOOLOGY(CBCS PATTERN)

(For the students admitted from the academic year **2025-2026 & onwards**)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course code** | | | **1AK** | **ANIMAL DIVERSITY** | | | **L** | **T** | **P** | **C** | |
| **Core/Elective/SBS/Allied** | | | | **Allied Course-I** | | | **0** | **4** | **0** | **3** | |
| **Pre-requisite** | | | | Basic Knowledge on DiversityofAnimal | | | | | | | |
| **Course Objectives:** | | | | | | | | | | | |
| 1. To give a preliminary knowledge of animal diversity and structural organization ofanimals. 2. To enlighten the students about the diverse forms of Invertebrate and Vertebrate animals present aroundus. 3. To help our students to distinguish various animals and to know the evolutionary significance. | | | | | | | | | | | |
| **Expected Course Outcomes:** | | | | | | | | | | | |
| On the successful completion of the course, student will be able to: | | | | | | | | | | | |
| 1 | | The student will be able to identify and understand the animal diversity. | | | | | | | K2 | | |
| 2 | | The learner will be able to understand the diversity and basic taxonomy of Non  chordates. | | | | | | | K2 | | |
| 3 | | To analyze the economic importance of different animal species. | | | | | | | K4 | | |
| 4 | | To recognize how different body designs solve biological problems related to  physiological and environmental challenges. | | | | | | | K5 | | |
| 5 | | To realize the role of vertebrates in biological communities, ecological interactions,  and conservation problems | | | | | | | K3 | | |
| **K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create | | | | | | | | | | | |
|  | | | | | | | | | | | |
| **Unit:1** | | | **ANIMAL TAXONOMY** | | | | **10 hours** | | | | |
| Principles of Animal Taxonomy –Kingdom Protozoa –Salient features.  Type study: Paramecium - Habitat, Morphology and Conjugation. Life cycle of Plasmodium. Salient features of Phylum Porifera. | | | | | | | | | | | |
| **Unit:2** | | | **COELENTERATA, PLATYHELMINTHES**  **AND ANNELIDA** | | | | **12 hours** | | | | |
| Outlines of Kingdom Animalia. Salient features of Phylum Coelenterata, Platyhelminthes,  Aschelminthes, Annelida with any two examples. Colonial organization of Obelia, Parasitic adaptations in Helminthes. External features of Earthworm. | | | | | | | | | | | |
| **Unit:3** | | | **ARTHROPODA, MOLLUSCA**  **AND ECHINODERMATA** | | | **12 hours** | | | | | |
| Salient features of Phylum Arthropoda, Mollusca and Echinodermata with any two examples.  Type study: Cockroach – External features, Mouthparts, Digestive, Nervous and Reproductive system. Economic importance of Mollusca. | | | | | | | | | | | |
| **Unit:4** | | | **FISHES AND AMPHIBIA** | | | **12 hours** | | | | | |
| Characters and classification up to Subphylum of Chordates. Salient features of Fishes and Amphibia. Type Study: Frog - External features, Digestive System, Circulatory System,  Urinogenital System and Brain. | | | | | | | | | | | |
| **Unit:5** | | | **REPTILES, AVES AND MAMMALS** | | | **12 hours** | | | | | |
| Salient features Reptiles, Aves and Mammals with two examples. Type study: Rabbit -Morphology, | | | | | | | | | | | |
| Digestive System, Circulatory System, and Urinogenital Systems. | | | | | | | | | | |
| **Unit:6** | | | **CONTEMPORARY ISSUES** | | **2 hours** | | | | | |
| Expert lectures, online seminars – webinars | | | | | | | | | | |
|  | | | | | | | | | | |
|  | | | **Total Lecture hours** | | **60 hours** | | | | | |
| **Text Book(s)** | | | | | | | | | | |
| 1 | Nair NC, Leelavathy S, SoundaraPandian N and Arumugam N. (2013). *A Text Book of*  *Invertebrates,*Saras Publication Nagercoil, Tamilnadu. | | | | | | | | | |
| 2 | Thangamani A, Prasannakumar S, Narayanan LM, Arumugam N. (2013). *A Text Book of*  *Chordates,* Saras Publication, Nagercoil, Tamilnadu. | | | | | | | | | |
| **Reference Books** | | | | | | | | | | |
| 1 | Jordon EL and Verma PS. (2009), *Invertebrate Zoology*, 15th edition, S Chand and Co, Zoology  Delhi. | | | | | | | | | |
| 2 | Kotpal RL. (2014).*Invertebrates – Animal Diversity – I,* 11th edition,Rastogi Publications,  Meerut. | | | | | | | | | |
| 3 | Verma PS. (2010). *Chordate Zoology*, Reveised edition, S Chand Publishers, New Delhi. | | | | | | | | | |
| **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]** | | | | | | | | | | |
| 1 | <https://www.acs.edu.au/courses/invertebrate-animals-730.aspx> | | | | | | | | | |
|  | | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Mapping with Programme Outcomes** | | | | | | | | | | |
| **COs** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** |
| **CO1** | S | S | S | S | M | S | M | M | M | M |
| **CO2** | S | M | M | S | S | S | M | L | L | L |
| **CO3** | S | M | M | S | S | S | S | L | S | M |
| **CO4** | S | S | M | M | M | S | S | L | S | S |
| **CO5** | S | S | M | S | S | S | M | L | S | S |

\*S-Strong; M-Medium; L-Low

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course code** | | | **2AK** | **Physiology, Developmental Biology and Immunology of Animals** | | | **L** | **T** | **P** | **C** |
| **Core/Elective/SBS/Allied** | | | | **Allied Course-II** | | | **0** | **4** | **0** | **3** |
| **Pre-requisite** | | | | Knowledge about Physiology and EmbryologyofAnimals | | | | | | |
| **Course Objectives:** | | | | | | | | | | |
| 1. To give a brief introduction to important Physiological aspects ofanimals. 2. To give an insight to Developmental biology and Immunology ofanimals. 3. To give students idea about biomolecules. | | | | | | | | | | |
| **Expected Course Outcomes:** | | | | | | | | | | |
| On the successful completion of the course, student will be able to: | | | | | | | | | | |
| 1 | | The student will be able explain the basics of advanced concepts in Zoology. | | | | | | | K2 | |
| 2 | | The course may motivate the learners to apply the zoological concepts in their  higher studies and research. | | | | | | | K4 | |
| 3 | | The students will be able to understand the basic physiological process related to  adaptation, metabolism and major requirements | | | | | | | K3 | |
| 4 | | To acquire basic knowledge on Immunology. | | | | | | | K2 | |
| 5 | | The learner will be able to understand the basic concepts of Embryology. | | | | | | | K2 | |
| **K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create | | | | | | | | | | |
|  | | | | | | | | | | |
| **Unit:1** | | | **DIGESTION AND RESPIRATION** | | | | **12 hours** | | | |
| Digestion of Carbohydrates, Protein and Lipids. Types of blood cells - Respiratory pigments–  Structure and function of Hemoglobin - Transport of carbon dioxide. | | | | | | | | | | |
| **Unit:2** | | | **EXCRETION AND NERVOUS SYSTEM** | | | | **10 hours** | | | |
| Ammonotellic, Ureotellic and Uricotellic animals – Structure of Nephron and formation of Urine (Brief outline). Structure of Neuron and conduction of Nerve impulse. | | | | | | | | | | |
| **Unit:3** | | | **MUSCLES AND HORMONES** | | | **12 hours** | | | | |
| Types of Muscles – Structure of Striated Muscle – Sliding Filament Theory.  Role and deficiency of Pituitary hormones, Thyroxine, Insulin and Glucagone, Oestrogen, Progesterone, Androgens and Aldosterone. | | | | | | | | | | |
| **NUnit:4** | | | **DEVELOPMENTAL BIOLOGY** | | | **12 hours** | | | | |
| Structure of Human Sperm and Graffian follicle – Types of vertebrate eggs –Brief outlines of  mechanism of fertilization – Cleavage, Blastula and Gastrula of frog. | | | | | | | | | | |
| **Unit:5** | | | **IMMUNOLOGY** | | | **12 hours** | | | | |
| Types of Immunity – Antigen and antibody reaction –Structure of Immunoglobulin. AIDS:  Causative factors –Symptoms and Prevention. Principle of ELISA. | | | | | | | | | | |
| **Unit:6** | | | **CONTEMPORARY ISSUES** | | **2 hours** | | | | | |
| Expert lectures, Online Seminars - Webinars and Field Visits. | | | | | | | | | | |
|  | | | **Total Lecture hours** | | **60hours** | | | | | |
| **Text Book(s)** | | | | | | | | | | |
| 1 | Arumugam N.(2017). *Developmental Zoology,* Saras Publication, Nagarcoil,Tamilnadu. | | | | | | | | | |
| 2 | Ajoy Paul. (2016). *Textbook of Immunology,* Books and Allied (P) Ltd, Kolkata. | | | | | | | | | |
| 3 | Prasanakumar S, Meena A, MeyyanPillai RP, DulsyFathima, Narayanan LM and Nallasingam K. (2017). *Animal Physiology and Biochemistry,* Saras Publication, Nagarcoil,  Tamilnadu. | | | | | | | | | |
| **Reference Books** | | | | | | | | | | |
| 1 | Lal SS and Sanjeev Kumar.(2015). *Immunology*, Rastogi Publication, Meerut. | | | | | | | | | |
| 2 | Sastry KV and PriyankaMathur. (2018). *Animal Physiology and Biochemistry,* Rastogi  Publication, Meerut. | | | | | | | | | |
| 3 | Yadav PR. (2001). *A Text Book of Embryology,* Campus Books International, New Delhi. | | | | | | | | | |
|  | | | | | | | | | | |
| **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]** | | | | | | | | | | |
| 1 | <https://www.edx.org/learn/physiology> | | | | | | | | | |
| 2 | <https://onlinecourses.nptel.ac.in/noc20_bt35/preview> | | | | | | | | | |
|  | | | | | | | | | | |
| **Course Designed By: Dr. P.STALIN, Asst.Prof, Erode Arts and Science College, Erode.** | | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Mapping with Programme Outcomes** | | | | | | | | | | |
| **COs** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** |
| **CO1** | S | S | S | S | M | S | M | M | M | M |
| **CO2** | S | M | M | S | S | M | M | L | L | L |
| **CO3** | S | M | M | S | S | S | S | L | S | M |
| **CO4** | S | S | M | M | M | S | S | L | S | S |
| **CO5** | S | S | M | S | S | S | M | L | S | S |

\*S-Strong; M-Medium; L-Low

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Course code** | | **2PK** | **ALLIED ZOOLOGY PRACTICAL** | **L** | **T** | **P** | **C** |
| **Allied** | | | **ALLIED ZOOLOGY** | **0** | **0** | **2** | **2** |
| **Pre-requisite** | | | Practical Knowledge of Animal Diversity, Microbiology and Physiology | | | | |
| **Course Objectives**: | | | | | | | |
| 1. Learn and be familiar with the Laboratorytechniques. 2. To understand the taxonomic position, body organization and evolutionary relationship ofanimals. 3. To inculcate the significance of various non-chordates andchordates. | | | | | | | |
| **Expected Course Outcomes:** | | | | | | | |
| On the successful completion of the course, student will be able to: | | | | | | | |
| 1 | Familiar with practical skills in the use of tools, technologies and methods common  to microbiology and physiology. | | | | | K2 | |
| 2 | Apply knowledge and come to know how to handle different organisms. | | | | | K3 | |
| 3 | Analyze and to observe various specimens by using Microscope. | | | | | K4 | |
| **K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create | | | | | | | |
| **MAJOR PRACTICAL** | | | | | | | |
| 1. Qualitative detection of carbohydrate, Protein andlipids. 2. Qualitative detection of excretory products (Ammonia, Urea, Uricacid). | | | | | | | |
| **MINOR PRACTICAL** | | | | | | | |
| 1. ABO bloodgroup. 2. Hanging drop preparation to observe motility of Paramecium. | | | | | | | |
| **SPOTTERS** | | | | | | | |
| **Identification and Description of :**   * Paramecium, Paramecium Conjugation, Binary fission * Obelia Colony, Obelia Medusa * Liverfluke, Tape worm, Ascaris male and female * Earthworm, Cockroach/Prawn, Drosophila * Pila, Starfish * Amphioxus * Shark, Scales of Fishes, * Frog, Frog Egg, Blastula and Gastrula. * Quill feather | | | | | | | |

|  |  |
| --- | --- |
| **QUESTION PATTERN: TOTAL MARKS: 30 MARKS.**  **Major: 10, Minor: 05, Record: 05, Spotter: 10(5 spotters each carry 2 marks).** | |
| **TotalPracticalHours 30(Each Semester) x 2 = 60 Hours PerYear** | |
| **Text Book(s)** | |
| 1 | Arumugam N. (2013). *Developmental Zoology*, Saras Publication, Nagercoil, Tamilnadu, India. |
| 2 | Das S. (2020).*Microbiology Practical Manual,* CBS Publication,Delhi. |
| 3 | [Jayasurya, Arumugam N,](https://www.sapnaonline.com/shop/author/jayasurya) [Dulsy Fatima. (2013). *Practical Zoology Vol 3,*](https://www.sapnaonline.com/shop/author/dulsy-fatima)Saras Publication, Nagercoil, Tamilnadu, India. |
| 4 | Singh HR and Neerajkumar. (2014). *Animal Physiology and Biochemistry*, Vishal Publishing Co. Jalandhar, Delhi. |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Mapping with Programme Outcomes** | | | | | | | | | | |
| **COs** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** |
| **CO1** | S | S | M | S | L | M | S | L | S | S |
| **CO2** | S | S | M | M | M | L | M | L | S | S |
| **CO3** | S | S | L | S | M | L | L | L | S | S |

\*S-Strong; M-Medium; L-Low