# BHARATHIAR UNIVERSITY: COIMBATORE 641 046

## ALLIED ZOOLOGY (CBCS PATTERN)

(For the students admitted from the academic year **2023-2024**)

| **Course code** | **1AK** | **ANIMAL DIVERSITY** | **L** | **T** | **P** | **C** |
|---|---|---|---|---|---|---|
| **Core/Elective/SBS/Allied** | | **Allied Course-I** | **4** | **0** | **0** | **3** |
| **Pre-requisite** | | Basic Knowledge on Diversity of Animal | | | | |

**Course Objectives:**

1. To give a preliminary knowledge of animal diversity and structural organization of animals.
2. To enlighten the students about the diverse forms of Invertebrate and Vertebrate animals present around us.
3. To help our students to distinguish various animals and to know the evolutionary sequence of them.

**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 | Understand the economic importance of animal diversity | 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, CELLULAR AND DEVELOPMENTAL BIOLOGY OF ANIMALS | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/Elective/SBS/Allied | | Allied Course-II | 4 | 0 | 0 | 3 |
| Pre-requisite | | Knowledge about Physiology and Developmental Biology of Animals | | | | |

**Course Objectives:**

1. To give a brief introduction to the Cellular and Physiological aspects of animals.
2. Have an enhanced knowledge on Microscopes, Cytological techniques.
3. To give an insight to Developmental biology and Immunology of animals.
4. To give students idea about Teratogenesis, Invitro fertilization, Stem cells and Amniocentesis.

**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. | K2 |
| 3 | The students will be able to understand the basic physiological process related to adaptation, metabolism and major requirements | K3 |
| 4 | To acquire knowledge on mutation, applied genetics and population genetics | K3 |
| 5 | The learner will be trained in preparing solutions and handling instruments at basic level. | K4 |

**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 |
|---|---|---|

Mechanism of Blood Clotting (Brief outline), 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.

| Unit:4 | EMBRYOLOGY | 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** | **IMMUNITY** | **12 hours** |
|---|---|---|
| Types of Immunity – Antigen and antibody reaction –Structure of Immunoglobulin. AIDS: Causative factors –Symptoms and Prevention. Principle of ELISA. Importance of Drosophila in Genetics. | | |
| **Unit:6** | **CONTEMPORARY ISSUES** | **2 hours** |
| Expert lectures, Online Seminars - Webinars and Field Visits. | | |
| | **Total Lecture hours** | **60 hours** |

| **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, Meyyan Pillai 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 Priyanka Mathur. (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 Laboratory techniques.
2. To understand the taxonomic position, body organization and evolutionary relationship of animals.
3. To inculcate the significance of various non chordates and chordates.

**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**

a. Qualitative detection of carbohydrate, Protein and lipids.

b. Qualitative detection of excretory products (Ammonia, Urea, Uric acid).

**MINOR PRACTICAL**

a. ABO blood group.

b. 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.**<br>**Major: 10, Minor: 05, Record: 05, Spotter: 10 (5 spotters each carry 2 marks).** | |
|---|---|
| **Total Practical Hours** | **30(Each Semester) x 2 = 60 Hours Per Year** |
| **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, Dulsy Fatima. (2013). *Practical Zoology Vol 3,* 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