

SYLLABUS & PROGRAMME STRUCTURE

Zoology

(Honours)

(Choice Based Credit System)

(Effective from the Academic Session 2017-2018)

Third Semester

MAHARAJA BIR BIKRAM UNIVERSITY
AGARTALA, TRIPURA: 799004

PROGRAMME STRUCTURE

Structure of Proposed CBCS Syllabus B.A/B.Sc/B.Com Honours.

Semester	Core Course (14) Honours	Ability Enhancement Compulsory Course (AECC) (2)	Skill Enhancement Course (SEC) (2)	Discipline Specific Elective (DSE) (4)	Generic Elective (GE) (4)
1	C1 C2	AECC1: Environmental Science			GE1 (Paper-I of selected subject other than Hons subject)
2	C3 C4	AECC2 : (English/MIL (Communication)			GE2 (Paper-II of selected subject other than Hons subject)
3	C5 C6 C7		SEC1		GE3 (Paper-III of selected subject other than Hons subject)
4	C8 C9 C10		SEC2		GE4 (Paper-IV of selected subject other than Hons subject)
5	C11 C12			DSE1 DSE2	
6	C13 C14			DSE3 DSE4	

Semester-III
Core Course - Paper –V
DIVERSITY OF CHORDATA

TOTAL MARKS – 100
(Theory – 70, Practical-30)

THEORY

(Credits 4)

Unit I

Chordates and its Origin

1. General characteristics and outline classification of chordates.
2. Urochordata and Cephalochordata; Study of larval forms in protochordates, Retrogressive metamorphosis in Urochordata with reference to Ascidia/Herdmania.
3. Dipleurula concept and the Echinoderm theory of origin of chordates (Gastrang's Theory and its advancement).

Unit II

Agnatha, Pisces and Amphibia

1. General characteristics and classification of cyclostomes up to Order.
2. General characteristics of Chondrichthyes and Osteichthyes, Classification up to Order, Osmoregulation and Parental care in fishes
3. General characteristics and classification up to Order; Parental care in amphibians.

Unit III

Reptilia and Aves

1. General characteristics and classification up to order, Poison apparatus and Biting mechanism in snakes.
2. General characteristics and difference between Ratitae & Carinitae, Archaeopteryx- a connecting link;
3. Flight adaptations and Migration in birds.

Unit IV

Mammalia, Zoogeography and Plate Tectonics

1. General characters and classification up to order, Differences of Prototheria, Metatheria and Eutheria in connection with reproductive system.
2. Zoogeographical realms, distribution of vertebrates in different Zoogeographical realms.
3. Plate tectonics and Continental drift theory.

DIVERSITY OF CHORDATA PRACTICAL

(Credits 2)

1. Identification with reasons:

Ascidia/Herdmania, Branchiostoma, Petromyzon, MyxineScoliodon, Heteropneustes,Labeo, Exocoetus, Echeneis, Hippocampus, Tetradon, Anabas, Amphipnous, Ichthyophis/ Ureotyphlus, Bufo, Hyla, Necturus, Tylostotriton(Darjeeling salamander), *Chelone, Hemidactylus, Varanus, Chamaeleo, Draco, Bungarus, Naja, Hydrophis*(Sea snake), *Ptyas* (common rat snale), *Xenochorphis*, (checkered keelback),*Crocodylus*.

2. (a) Key for Identification of poisonous and non-poisonous snakes.
- (b) Study of 3 (three) common birds from North East India.
- (c) Study of feathers/ beaks/claws.
- (c) Comparative study of bats (Microchiroptera & Megachiroptera).

3. Mount of pecten and hyoid apparatus from Fowl head.

NOTE: 1): Power Point presentation on study of any two animals from two different classes by students with reference to endangered / threatened mammals of Tripura.

NOTE: 2): Classification from Young, J. Z. (2004) to be followed.

Suggested Readings :

1. Young, J. Z. (2004). *The Life of Vertebrates*. 3rd Edition. Oxford university press.
2. Pough H et. al . *Vertebrate life*, 8th Edition, Pearson International.
3. Darlington P.J. (1996) *The Geographical Distribution of Animals*, R.E. Krieger Pub Co.
4. Hall B.K. and Hallgrimsson B. (2008). *Strickberger's Evolution*. 4th Edition, Jones and Bartlett Publishers Inc.
5. [Poddar](#), T. K. et.al. 2017. *An Advanced Laboratory Manual of Zoology*, LaxmiPublicaton, New Delhi (Prev. © 2002 MACMILLIAN INDIA LTD-NEW DELHI).
6. Chatterjee, A &Chakraborti, C. 2010. *Practical Zoology (Part-I, II & III)*, Nirmala Library, Kolkata.

Semester - III
Core Course – Paper VI
ANIMAL PHYSIOLOGY: CONTROLLING AND COORDINATING
SYSTEMS

THEORY

(Credits 4)

Unit I

Study of mammalian tissues

1. Structure, location, classification and functions of epithelial tissue, connective tissue, muscular tissue and nervous tissue.
2. Structure and types of bones and cartilages.

Unit II

Nervous System

1. Structure of neuron, resting membrane potential, Origin of action potential and its propagation across the myelinated and non-myelinated nerve fibers;
2. Types of synapse, Synaptic transmission and Neuromuscular junction; Reflex action and its types, reflex arc;

Unit III

Musculature and Reproduction

1. Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction.
2. Histology of testis and ovary, Structure and function of male and female reproductive system of mammals with reference to human.

Unit IV

Endocrine System

1. Histology of endocrine glands - pineal, pituitary, thyroid, parathyroid, pancreas, adrenal and hormones secreted by them.
2. Classification of hormones; Regulation of their secretion; Mode of hormone action.
3. Hypothalamus (neuroendocrine gland) - principal nuclei involved in neuroendocrine control of anterior pituitary and other endocrine glands.
4. Role of Placental hormones.

ANIMAL PHYSIOLOGY: CONTROLLING AND COORDINATING SYSTEMS PRACTICALS

(Credits 2)

1. Preparation and study of temporary tissue mounts: Squamous epithelium, Striated muscle fibres and nerve cells.
2. Study of permanent slides of mammalian Skin, Bone, Spinal cord, Nerve cell, Pituitary, Pancreas, Testis, Ovary, Adrenal, Thyroid and Parathyroid.
3. Microtomy: Preparation and identification of permanent slide of any five mammalian (Goat/Pig) tissues

Suggested Books :

1. *Guyton, A.C. & Hall, J.E. (2006). Textbook of Medical Physiology. 11th Edition. Hercourt Asia PTE Ltd. /W.B. Saunders Company.*
 2. *Tortora, G.J. & Grabowski, S. (2006). Principles of Anatomy & Physiology. 11th Edition John Wiley & Sons.*
 3. *Victor P. Eroschenko. (2008). diFiore's Atlas of Histology with Functional correlations. 12th Edition. Lippincott W. & Wilkins.*
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Semester - III
Core Course –Paper - VII
FUNDAMENTALS OF BIOCHEMISTRY

THEORY

(CREDITS 4)

Unit I

Carbohydrates and Lipids

- a. Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides.
- b. Structure and Significance: Physiologically important saturated and unsaturated fatty acids.

Unit II

Proteins: Amino acids, Proteins and Immunoglobulins

- a. Structure, Classification and General properties of α -amino acids; Physiological importance of essential and non-essential α -amino acids
- b. Bonds stabilizing protein structure; Levels of organization in proteins; Introduction to simple and conjugated proteins.
- c. Basic Structure, Classes and Function, Antigenic Determinants.

Unit III

Nucleic Acids (RNA and DNA)

- a. Structure and Types : Purines and Pyrimidines, Nucleosides and Nucleotides.
- b. DNA: Base pairing, Denaturation and Renaturation.
- c. Watson and Crick Model.

Unit IV

Enzymes

- a. Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes.
- b. Mechanism of enzyme action; Enzyme kinetics; Factors affecting rate of enzyme-catalyzed reactions.
- c. Derivation of Michaelis-Menten equation, Concept of K_m and V_{max} .
- d. Enzyme inhibition; Allosteric enzymes and their kinetics; Regulation of enzyme action.

**FUNDAMENTALS OF BIOCHEMISTRY
PRACTICAL**

(CREDITS 2)

1. Qualitative tests of functional groups in carbohydrates, proteins and lipids.
2. Paper chromatography of amino acids.
3. Action of salivary amylase under optimum conditions.
4. Effect of pH, temperature and inhibitors on the action of salivary amylase.

Suggested Reading :

1. Cox, M.M and Nelson, D.L. (2008). *Lehninger's Principles of Biochemistry, V Edition*, W.H. Freeman and Co., New York.
 2. Berg, J.M., Tymoczko, J.L. and Stryer, L. (2007). *Biochemistry, VI Edition*, W.H. Freeman and Co., New York.
 3. Murray, R.K., Bender, D.A., Botham, K.M., Kennelly, P.J., Rodwell, V.W. and Well, P.A. (2012). *Harper's Illustrated Biochemistry, 29th Edition, International Edition*, McGraw-Hill Companies Inc.
 4. Hames, B.D. and Hooper, N.M. (2000). *Instant Notes in Biochemistry, II Edition*, BIOS Scientific Publishers Ltd., U.K.
 5. Watson, J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M. and Losick, R. (2008). *Molecular Biology of the Gene, VI Edition*, Cold Spring Harbor Lab. Press, Pearson Pub.
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