

NORTH MAHARSHTRA UNIVERSITY, JALGAON

Syllabus for FYBSc ZOOLOGY under CBCS Pattern

(wef June 2018)

Examination Pattern 60:40

Semester	Core Course	Structure	Code & Title of the paper	Credit
I	CC A-I	Theory	ZOO 101 Animal Diversity I	02
		Theory	ZOO 102 Animal Diversity II	02
		Practical	ZOO 103 Animal Diversity I & II	02
II	CC A-II	Theory	ZOO 201 Comparative Anatomy of Vertebrates	02
		Theory	ZOO 202 Developmental Biology of Vertebrates	02
		Practical	ZOO 203 Comparative Anatomy & Developmental Biology of Vertebrates	02
Total Credits Sem I & II= 12				

1 Credit = 15 Periods = 25 Marks

FYBSc Zoology Semester I
Core Course A-I
ZOO 101 : ANIMAL DIVERSITY I

CREDITS 2

Unit 1: Kingdom Protista	4
General characters and classification up to classes; Locomotory Organelles and locomotion in Protozoa	
Unit 2: Phylum Porifera	3
General characters and classification up to classes; Canal System in <i>Sycon</i>	
Unit 3: Phylum Cnidaria	3
General characters and classification up to classes; Polymorphism in Hydrozoa	
Unit 4: Phylum Platyhelminthes	3
General characters and classification up to classes; Life history of <i>Taenia solium</i>	
Unit 5: Phylum Nemathelminthes	4
General characters and classification up to classes; Life history of <i>Ascaris lumbricoides</i> and its parasitic adaptations	
Unit 6: Phylum Annelida	3
General characters and classification up to classes; Metamerism in Annelida	
Unit 7: Phylum Arthropoda	4
General characters and classification up to classes; Vision in Arthropoda, Metamorphosis in Insects	
Unit 8: Phylum Mollusca	3
General characters and classification up to classes; Torsion in gastropods	
Unit 9: Phylum Echinodermata	3
General characters and classification up to classes; Water-vascular system in Asteroidea	

SUGGESTED READINGS

- Ruppert and Barnes, R.D. (2006). *Invertebrate Zoology*, VIII Edition. Holt Saunders International Edition.
- Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). *The Invertebrates: A New Synthesis*, III Edition, Blackwell Science
- Kotpal R L (2009): Modern textbook of Zoology Invertebrates, Rastogi Publication.
- Hall B.K. and Hallgrimsson B. (2008). *Strickberger's Evolution*. IV Edition. Jones and Bartlett Publishers Inc.

FYBSc Zoology Semester I

Core Course A-I

ZOO 102 : ANIMAL DIVERSITY II

CREDITS 2

Unit 1: Protochordates	3
General features and Phylogeny of Protochordata	
Unit 2: Agnatha	3
General features of Agnatha and classification of cyclostomes up to classes	
Unit 3: Pisces	4
General features and Classification up to orders; Osmoregulation in Fishes	
Unit 4: Amphibia	5
General features and Classification up to orders; Metamorphosis in frog, Parental care,	
Unit 5: Reptiles	5
General features and Classification up to orders; Extinct reptiles, Poisonous and non-poisonous snakes, Biting mechanism in snakes	
Unit 6: Aves	5
General features and Classification up to orders; Flight adaptations in birds	
Unit 7: Mammals	5
Classification up to orders; Origin of mammals	

SUGGESTED READINGS

- Young, J. Z. (2004). *The Life of Vertebrates*. III Edition. Oxford university press.
- Kotpal R L (2009): *Modern textbook of Zoology Vertebrates*, Rastogi Publication.
- Hall B.K. and Hallgrimsson B. (2008). *Strickberger's Evolution*. IV Edition. Jones and Bartlett Publishers Inc.
- Lal S.S. (1996): *Textbook of Practical Zoology Vertebrates*, Rastogi Publications

FYBSc Zoology Semester I

Core Course A-I

Practical: ZOO 103

ANIMAL DIVERSITY I & II

CREDITS 2

1. Study of the following specimens (Invertebrates):

Amoeba, Euglena, Plasmodium, Paramecium, Sycon, Hyalonema, and Euplectella, Obelia, Physalia, Aurelia, Tubipora, Metridium, Taenia solium, Male and female Ascaris lumbricoides, Aphrodite, Nereis, Pheretima, Hirudinaria, Palaemon, Cancer, Limulus, Palamnaeus, Scolopendra, Julus, Periplaneta, Apis, Chiton, Dentalium, Pila, Unio, Loligo, Sepia, Octopus, Pentaceros, Ophiura, Echinus, Cucumaria and Antedon.

2. Study of the following permanent slides:

T.S. and L.S. of *Sycon*, Study of life history stages of *Taenia*, T.S. of Male and female *Ascaris*

3. Study of the following specimens (Vertebrates):

Balanoglossus (Hemichordata), *Herdmania*, *Branchiostoma*, *Petromyzon*, *Sphyrna*, *Pristis*, *Torpedo*, *Labeo*, *Exocoetus*, *Anguilla*, *Ichthyophis/Ureotyphlus*, *Salamandra*, *Bufo*, *Hyla*, *Chelone*, *Hemidactylus*, *Chamaeleon*, *Draco*, *Vipera*, *Naja*, *Crocodylus*, *Gavialis*, Any six common birds from different orders, *Sorex*, Bat, *Funambulus*, *Loris*

4. Key for Identification of poisonous and non-poisonous snakes

An “**animal album**” containing photographs, cut outs, with appropriate write up about the above mentioned taxa. Different taxa/ topics may be given to different sets of students for this purpose.

FYBSc Zoology Semester II

Core Course A-II

ZOO201: COMPARATIVE ANATOMY OF VERTEBRATES

CREDITS 2

Unit 1: Integumentary System Derivatives of integument w.r.t. glands and digital tips	4
Unit 2: Skeletal System Evolution of visceral arches	3
Unit 3: Digestive System Brief account of alimentary canal and digestive glands	4
Unit 4: Respiratory System Brief account of Gills, lungs, air sacs and swim bladder	5
Unit 5: Circulatory System Evolution of heart and aortic arches	4
Unit 6: Urinogenital System Succession of kidney, Evolution of urinogenital ducts	4
Unit 7: Nervous System Comparative account of brain	3
Unit 8: Sense Organs Types of receptors	3

SUGGESTED READINGS

- Kardong, K.V. (2005) *Vertebrates' Comparative Anatomy, Function and Evolution*. IV Edition. McGraw-Hill Higher Education.
- Kent, G.C. and Carr R.K. (2000). *Comparative Anatomy of the Vertebrates*. IX Edition. The McGraw-Hill Companies.
- Hilderbrand, M and Gaslow G.E. *Analysis of Vertebrate Structure*, John Wiley and Sons.
- Walter, H.E. and Sayles, L.P; *Biology of Vertebrates*, Khosla Publishing House.

FYBSc Zoology Semester II

Core Course A-II

ZOO 202 : DEVELOPMENTAL BIOLOGY OF VERTEBRATES

CREDITS 2

Unit 1: Early Embryonic Development

12

Gametogenesis: Spermatogenesis and oogenesis w.r.t. mammals, vitellogenesis in birds; Fertilization: external (amphibians), internal (mammals), blocks to polyspermy; Early development of frog and humans (structure of mature egg and its membranes, patterns of cleavage, fate map, up to formation of gastrula); types of morphogenetic movements; Fate of germ layers; Neurulation in frog embryo.

Unit 2: Late Embryonic Development

10

Implantation of embryo in humans, Formation of human placenta and functions, other types of placenta on the basis of histology; Metamorphic events in frog life cycle and its hormonal regulation.

Unit 3: Control of Development

8

Fundamental processes in development (brief idea) – Gene activation, determination, induction, Differentiation, morphogenesis, intercellular communication, cell movements and cell death

SUGGESTED READINGS

- Gilbert, S. F. (2006). *Developmental Biology*, VIII Edition, Sinauer Associates, Inc., Publishers, Sunderland, Massachusetts, USA.
- Balinsky, B.I. (2008). *An introduction to Embryology*, International Thomson C. Press.
- Carlson, Bruce M (1996). *Patten's Foundations of Embryology*, McGraw Hill, Inc.

FYBSc Zoology Semester II

Core Course A-II

Practical: ZOO 203

COMPARATIVE ANATOMY & DEVELOPMENTAL BIOLOGY OF VERTEBRATES

CREDITS 2

1. Study of bones (Osteology):

- a) Disarticulated skeleton of fowl and rabbit
- b) Carapace and plastron of turtle /tortoise
- c) Mammalian skulls: One herbivorous and one carnivorous animal.

2. Frog Embryology - Study of developmental stages - whole mounts and sections through permanent slides – cleavage stages, blastula, gastrula, neurula, tail bud stage, tadpole external and internal gill stages.

3. Study of the different types of placenta- histological sections through permanent slides or photomicrographs.

4. Examination of gametes - frog/rat - sperm and ova through permanent slides or photomicrographs.